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ABSTRACT

The objectives of this module include: (1) improving general arithmetic skills including whole numbers, fractions, and decimal fractions; (2) learning to compute averages; (3) strengthening knowledge of percent; (4) learning to locate needed information or statistical data; (5) reviewing or learning the use of the Pythagorean Theorem; (6) reinforcing knowledge of the concepts of area and volume; (7) learning to locate points on a coordinate system; and (8) making calculations related to a circle. Several strong recommendations concerning the use of this module are given. These are: (1) for motivational reasons, it should be used during baseball season, and (2) the annual film on the World Series produced by the Coca Cola Company should be shown as an introduction to the module. (MK)

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TOPICAL MODULE FOR USE

IN A

MATHEMATICS LABORATORY SETTING

TOPIC: MATHEMATICS IN BASEBALL

BY

Mary Stitt and Nat Ostrom

A Publication of

University of Denver
Mathematics Laboratory
Regional Center for
Pre-College Mathematics

Dr. Ruth I. Hoffman, Director

Materials:

World Series Film
*Official Rules of Baseball
Tape measure or yard sticks
Large sheet butcher paper
Official baseball
Statistics from newspaper
Baseball card game deck
Markers for card game

*Included in module

SE 030 319

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OBJECTIVES: Students will

- improve general arithmetic skills including whole numbers, fractions and decimal fractions.
- learn how to compute an average
- strengthen their knowledge of percent
- learn how to do research in materials provided them in order to locate needed information or statistical data
- either review or learn the use of the Pythagorean Theorem
- reinforce their knowledge of the concept of area and volume
- learn to locate points on a coordinate system
- make calculations relating to a circle: area and circumference

INTRODUCTION:

There are several strong recommendations concerning the utilization of this module, the first being that for motivational reasons it should be used during baseball season, that is early or late in the school year.

Secondly, it is urged that you arrange to obtain a copy of the annual film on the World Series produced by The Coca Cola Company and show it as an introduction to the module. We previewed "World Series, 1972" and found it to be outstanding in every way. We include in the packet information concerning availability of the

the film. Order it well in advance if you want it at a time appropriate to use with this module. Ask for the most recent World Series film available in an attempt to obtain a copy, even if not the most recent games.

You will, no doubt, need more than the one copy of the Official Baseball Rules which we enclose, since many questions in the module require that resource. Listed in the Bibliography is a source for that pamphlet, but local sporting goods stores often stock them.

The various activities of this module do not have to be done in a particular sequence; you may, therefore, follow your own inclinations or those of your students. For example, the field trip (card 12) may come much earlier. If you or your students have recommendations or suggestions, please forward them to us.

THE BASEBALL MODULE

Card 1 - Some students may be interested in verifying the figure in the last paragraph, or in comparing earnings of major vs. minor league palyers.

Cards 3.0, 3.1 - Official Baseball Rules helpful. Students may want to bring in and post newspaper box scores and other statistics.

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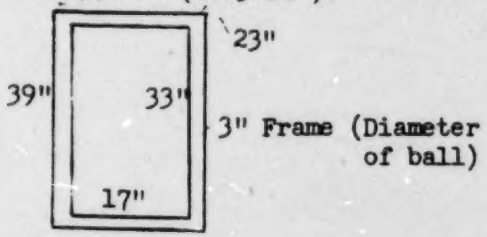
Pages 3A, 3B, etc. These pages which are lettered are for duplicating purposes. For example, possibly each student will want a copy of 3A.

Card 5 Here is a discussion of the last question on this card. Since the 33" vertical distance given approximate, it is appropriate to use 3" as the diameter of the ball, rather than 2.95" as computed in the last questions of card 4.

Then, by the definition of strike (section 2.00 page 9, of the 1973 official rules), we must add the diameter of the ball twice to each dimension of the strike zone rectangle which faces the pitcher (see diagram below). The answer is therefore 39" x 23" or 897 in^2 (6.23 ft^2).



Card 7 - The information (sheets 7A -E) furnished by the American and National Leagues are to be used for these exercises.

Card 10 After "Baseball Card Game" (composition of card deck on page 100) students not well acquainted with baseball may need to consult other students. For example, with 2 outs and a man on third, an out does not score the man from third.

LIST OF SOURCES FOR WORLD SERIES FILM*

Mr. F. J. Hendry, Jr.
Coca-Cola USA
5th Floor, Bear Hill Tower Bldg.
60 Hickory Drive
Waltham, Massachusetts 02154

Mr. G. C. Sutcliffe
Coca-Cola USA
300 Marcus Avenue
Suite 3E4
Lake Success, NY 11040

Mr. R. L. Young
Coca-Cola USA
570 Ritchie Highway
Severna Park, Maryland 21146

Mr. J. C. Yeomans
Coca-Cola USA
P. O. Drawer 1734
Atlanta, Georgia 30301

Mr. K. P. Tabb
Coca-Cola USA
P. O. Drawer 3590
Norland Branch
19090 N. E. Fourth Court
Miami, Florida 33169

Mr. T. L. Juza
Coca-Cola USA
1330 Hanna Building
Cleveland, Ohio 44115

Mr. B. G. Johnson
Coca-Cola USA
P. O. Box 7186
Dallas, Texas 75209

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Mr. W. C. Ross
Coca-Cola USA
7400 North Oak Park Avenue
Chicago, Illinois 60648

Mr. C. P. Francis
Coca-Cola USA
800 West 47th Street
Suite 404
Kansas City, Missouri 64112

Mr. C. H. Scott
Coca-Cola USA
Rooms 310-312, Marquam Plaza Bldg.
2525 S. W. Third Avenue
Portland, Oregon 97201

Mr. J. B. Martin
Coca-Cola USA
P. O. Box 2366
No. Hollywood, California 91602

* If you have difficulty, contact your closest Coca-Cola Bottling Company.

Bibliography

Official Baseball Rules
Published each year by the
National Baseball Congress of America
P. O. Box 1420
Wichita, KS 67201
Normally available in sporting
good stores.

Turkin, Hy and S. C. Thompson
The Official Encyclopedia of Baseball, 1970
Barnes Publishing
New York, New York

American League
520 Boylston Street
Boston, Mass. 02116

National League
220 Montgomery Street
San Francisco, CA 94104

Commissioner of Baseball
Professional Baseball Government
680 5th Avenue
New York, NY 10019

Blank Card Source:

Butler Paper Company
601 W. 50th Avenue
Denver, CO 80212

Personalized Instruction Center
NCEBOCS
838 South Lincoln Street
Longmont, CO 80501

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Card #1

Baseball has been around -
Year - 1869 =
Ex. 1974 - 1869 = 105 years

Years National League did not have a rival -
1901 - 1869 = 25 years

Average earning
$\frac{\$37,000.00}{32 \text{ weeks}}$ = $1,156.25/week

Card #2

Total salary
$1,200 + 1,400 + 1,100 + 1,100 +
(8,000 x 6) = 9.600

Comparison:
Modern day players make slightly less than 4 times the salary of the entire first pro-team.

Overhand pitching - Year - 1884 =
Ex. 1974- 1884 = 90 years

Card #3

Percentage of games won
$\frac{\text{wins}}{\text{Total games}}$ = % of games won

Batting averages
$\frac{\text{hits}}{\text{Official at bats}}$ = batting average

Rules
Neither a walk nor sacrifice is an official time at bat.
The decimal equivalent for a percentage is listed.

No team with a greater team average lost.

Earned run average
An earned run is a run charged against the pitcher, i.e., not the result of an error.

$$\frac{9 \times \text{earned runs}}{\text{innings pitched}} = \text{ERA}$$

Low ERA is more desirable.

ERA is a per game statistic therefore the denominator needs to be divided by nine (or the numerator multiplied by nine) to convert from per inning to per game i.e., $\frac{9 \text{ innings}}{1 \text{ game}}$

Runs you expect a pitcher to give up per game = ERA

Runs per inning = $\frac{\text{ERA}}{9}$

Games Behind
Use this formula: G.B. = $\frac{(W - w) + (\ell - L)}{2}$

G.B. = Games Behind W = Total wins of league leader
w = Total wins of team behind ℓ = losses of team behind
L = losses of league leader

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Card # 4

$12^2 + 12^2 = W^2$

$W = 16.97$

A left hander has a shorter distance to run.

$90^2 + 90^2 = c^2$ $\quad c = 127.28$

Diameter of baseball 9 1/4 inches in circumference is the largest allowable for official play. Diameter is 2.94".

Card #5

The strike zone is a volume bounded by the top of the knees, armpits, front of the plate and back of the plate.

Your strike zone is extended three inches in any direction as a result of the 3" diameter of the ball.

Card # 6

Area of infield $A = s^2$ $\quad A = 8100$ sq. ft.
$A = 900$ sq. yds.

Area of pitcher's circle $A = \pi r^2$
$A = 254$ sq. ft.

Area of batters bax $A = \ell = w$ $\quad A = 24$ sq. ft.

Card #7

Wrigley Field (Chicago Cubs) does not have lights.

Municipal Stadium (Cleveland Indians) seats 76,997

Jarry Park (Montreal Expos) seats 28,000

$(402)^2 + (4) = C^2$ C = 402.02 Yankee Stadium

$(315)^2 + (37)^2 = C^2$ C = 317.17 Fenway Park

Card #8

Maximum attendance - 1,175,128

Average distance to a left field fence in National League = 335.1 American League = 339.1

Card #9

(4,3)	fair	infield
(-9,13)	fair	infield
(9,2)	fair	outfield
(-6,-1)	fair	infield
(7,22)	fair	homerun

All are fair.

(-14,3)	foul	
(14,3)	foul	
(6,26)	fair	homerun
(-6,26)	fair	home run
(2,7)	fair	outfield
(-2,7)	fair	outfield
(4, -8)	foul	

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Card #9 (Cont.d)

(-4,-8)	foul
(-17,17)	foul
(17,17)	foul

This field is symmetric. That is, holding the ordinate constant and changing the sign of the abscissa causes the ball to land in the same descriptive location on the field.

Card #11A

Difference in circumference of the "core" and the "pill". 1.58"

Difference in diameters - .50"

Difference in radii - .25"

Difference between the circumference of the "pill" and the overall circumference including the second winding of yarn - 4.06"

Difference in diameter between the "pill" and the first winding - 1.16

Differences in radii - .58"

The first winding is the thickest.

The third winding is the thinnest.

$(13/16 + 5/16 + 3/16) \times \pi = 21/16 \times \pi \cong 4\ 1/8$

The first actual professional baseball team was the Cincinnati Red Stockings in 1869. How long has professional baseball been around?

The National League was founded by William A. Hulbert and A. G. Spalding in 1876. In 1901 Byron (Ban) Johnson and Charles A. Comiskey formed the rival American League. For how many years did the National League go without a rival?

If the average earning of a professional, major league baseball player today is $37,000.00 per season and he plays about 32 weeks, how much does he earn per week during the season?

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Here are the annual salaries of the first pro team in 1869: Harry Wright, captain and center fielder, received $1,200; George Wright, short stop, received $1,400; Asa Brainard, pitcher, received $1,100; Fred Waterman, third base, made $1,100; and the following each received $800: Doug Allison, catcher; Charles Gould, first base; Charles Sweazy, second base; Andy Leonard, left fielder; Cal McVey, right fielder; and Dick Hurley, substitute. What was the total salary of the team?

How does the total salary of the first pro-team compare with the average annual salary of a modern day player?

Overhand pitching was introduced in 1884. How long has that been?

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How is the percentage of games won computed? Use 3C to compute this percentage for any three teams. Compare your percentages with the "Pct." listed.

How are batting averages computed? Use 3D to calculate batting averages for any five players.

Is a walk counted as a time at bat? A sacrifice? (see Official Baseball Rules). Complete 3E. Compare your result with the "Pct." listed. Can you explain the use of the decimal point in the listing?

Did any major league team win the game but have a lower batting average for that game than the losing team, according to page 3B?

What is an earned run against a pitcher? How is an ERA (earned-run-average) calculated? Which would be better for the pitcher, a low ERA or a high ERA? What is the reason for multiplying the number of runs by nine?

Using the information on 3D choose three pitchers and find out how many runs you would expect him to give up per game, then per inning. Complete 3E.

Study the baseball standings given on 3C. See if you can find a method for computing games behind (GB) which works in all cases.

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Abbrevations

ab = at bat
r = runs
h = hits
bi = batted in
E = errors
LOB = left on bases
DP = double play
2B = two base hit
3B = three base hit
HR = homerun
SB = stolen bases
SF = sacrifice fly
WP = winning pitcher
T = time
A = attendance
W = wins
L = losses
Pct. = % of games won and lost
GB = games behind

* IP = innings pitched
H = hits allowed by pitcher
R = runs allowed by pitcher
ER = earned-runs
BB = base on balls
SO = strike outs
ERA = earned-run average

RBI = runs batted in

*Pitching statistics

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American League Box Scores

Twins 9, Bosox 6

BOSTON	ab	r	h	bi	MINNESOTA	ab	r	h	bi
Harper lf	5	1	1	1	Carew 2b	5	1	1	0
Aparicio ss	4	0	2	2	Braun 3	4	2	3	1
Yastrzemski lb	3	1	0	0	Killebrew lb	3	2	1	1
RSmith cf	4	1	1	0	Oliva dh	4	2	1	2
Conigliaro dh	4	0	1	0	Uhlaender cf	4	0	0	0
RMiller pr	0	0	0	0	Darwin rf	4	1	2	3
Petrocelli 3b	4	1	2	2	Hicks rf	1	0	1	1
Fisk c	4	0	1	0	Holt lf	3	0	1	1
Griffin 2b	4	1	0	0	Thompson ss	4	0	1	0
DEvans rf	4	1	2	0	Reed c	4	0	1	1
Pattin p	0	0	0	0	Kaat p	0	0	0	0
Stanley p	0	0	0	0	Sanders p	0	0	0	0
Bolin p	0	0	0	0					
Total	36	6	10	6	Total	33	9	17	9

Boston	0	0	1	0	0	2	1	0	2	— 6
Minnesota	1	0	0	0	5	1	1	0	1	— 9

E—Thompson. Yastrzemski, D.Evans. DP—Boston 1. LOB—Boston 7, Minnesota 5. 2B—Killebrew, Braun. 3B—Harper. HR—Petrocelli (6). SB—Harper 2. SF—Holt. Aparicio, Hicks.

	IP	H	R	ER	BB	SO
Pattin (L,1-5)	5	5	5	3	1	2
Stanley	1⅓	5	4	4	2	2
Bolin	1⅔	2	0	0	0	2
Kaat (W,4-1)	7	3	0	0	1	6
Sanders	2	2	1	1	2	0

Save—Sanders (4). T—2:55. A—7,285.

K.C. 5, Brewers 3

KANSAS CITY	ab	r	h	bi	MILWAUKEE	ab	r	h	bi
Patek ss	4	1	2	0	DMay cf	5	1	1	1
Rojas 2b	5	1	1	0	Money ss	4	1	1	1
Otis cf	5	1	2	1	Lahoud rf	3	0	0	0
Mayberry lb	3	1	2	3	GThomas rf	2	0	0	1
Kirkpatrick lf	4	0	1	0	Scott lb	3	0	0	1
McRae rf	4	0	0	0	Briggs lf	3	0	0	1
Hovley rf	0	0	0	0	OBrown dh	3	0	1	0
Hopkins dh	3	0	1	0	Porter c	3	0	0	0
Piniella dh	1	0	0	0	Colavito ph	1	0	0	0
Schaal 3b	3	1	1	0	Fetske c	0	0	0	0
Healy c	3	0	0	0	Vukovich 3b	2	0	0	0
Busby p	0	0	0	0	TJohnson ph	1	0	0	0
MJackson p	0	0	0	0	Garcia 2b	4	0	2	0
Garber p	0	0	0	0	Staton p	0	0	0	0
					Champion p	0	0	0	0
					Newman p	0	0	0	0
Total	35	5	10	4	Total	31	2	4	2

Kansas City	0	0	3	0	0	0	0	1	1	— 5
Milwaukee	0	0	0	0	0	0	0	0	3	— 3

DP—Milwaukee 1. LOB—Kansas City 7, Milwaukee 9. 2B—Otis, Mayberry (6). D.May (5). S—Patek.

	IP	H	R	ER	BB	SO
Busby (W,3-5)	5⅔	3	1	1	4	4
M.Jackson	2⅓	1	0	0	2	3
Garber	1	0	0	0	0	0
Staton (L,1-3)	3	7	4	4	1	2
Champion	1	0	0	0	1	1
Newman	1	0	0	0	1	1

Save—Garber (8). WP—Champion 2. T—3:07. A—11,597.

Tigers 5, Texas 1

TEXAS	ab	r	h	bi	DETROIT	ab	r	h	bi
Ellis 2b	4	0	0	0	MAustin 3b	4	0	0	0
Harrah ss	3	0	1	0	Kaline rf	3	2	0	0
Billings lf	4	0	1	0	Northrup cf	4	2	2	0
Paciorek lb	4	1	1	0	Wilson lf	4	1	2	3
AJohnson dh	4	0	1	0	MStanley cf	0	0	0	0
Ruzzuolo rf	4	0	1	1	Sims c	4	0	0	0
Sudakis c	3	0	1	0	Rosso lb	4	0	0	0
Harris 3b	4	0	0	0	Cash dh	4	1	2	0
Madlock cf	3	0	1	0	ABedrosian 2b	3	1	1	0
Berman p	0	0	0	0	EBrabham ss	4	0	1	1
HOUSE p	0	0	0	0	JPerry p	0	0	0	0
					Hiller p	0	0	0	0
Total	33	1	7	1	Total	33	5	9	4

Texas	0	0	0	0	0	0	0	1	0	— 1
Detroit	1	0	0	0	1	1	0	0	2	— 5

E—Harrah. Burroughs. DP—Texas 4, Detroit 1. LOB—Texas 7, Detroit 7. HR—W.Horton (4).

	IP	H	R	ER	BB	SO
Berman (L,3-4)	5	7	3	3	4	3
Stanhouse	3	2	0	0	1	1
J.Perry (W,3-5)	7⅓	6	1	1	1	2
Hiller	1⅔	1	1	0	0	1

Save—Hiller (3). HBP—by Berman (A.Rodriguez). WP—Berman. T—3:39. A—9,639.

Angels 1, Orioles 0

CALIFORNIA	ab	r	h	bi	BALTIMORE	ab	r	h	bi
Grubaugh dh	3	0	0	0	Pattonmd rf	4	0	0	0
Valentine ss	4	0	1	0	Grich 2b	3	0	1	0
Meoli ss	0	0	0	0	TDavis dh	4	0	2	0
Berry cf	4	0	2	0	EWilliams 1b	3	0	0	0
FRobinson lf	4	1	1	0	Bumbry pr	0	0	0	0
ROliver 1b	4	0	3	1	Baylor lf	3	0	0	0
GHisle 3b	3	0	0	0	BRobinson 3b	3	0	1	0
Stanton rf	3	0	0	0	Blair cf	3	0	0	0
Kusnyer c	3	0	0	0	Eichelberg c	3	0	0	0
Alamar 2b	3	0	1	0	Belanger ss	3	0	1	0
RMay p	0	0	0	0	McNally p	0	0	0	0
Total	31	1	8	1	Total	30	0	5	0

California	0	0	0	0	0	0	0	1	0	— 1
Baltimore	0	0	0	0	0	0	0	0	0	— 0

DP—California 1, Baltimore 2. LOB—California 4, Baltimore 3. 2B—F.Robinson, R.Oliver, Grich.

	IP	H	R	ER	BB	SO
R.May (W,3-1)	9	5	0	0	4	4
McNally (L,3-4)	9	8	1	1	1	4

T—1:54. A—14,397.

A's 11, Indians 4

OAKLAND	ab	r	h	bi	CLEVELAND	ab	r	h	bi
Campaneris ss	4	1	0	0	RTorres rf	4	1	2	0
Maxvill ss	1	0	0	0	Bronaugh 2b	3	1	1	0
Morgan 2b	1	0	0	0	Chambliss 1b	4	0	0	0
DGreen 2b	3	1	1	0	Lolich lf	4	0	0	0
Hegan 1b	1	1	1	0	Gamble dh	4	1	2	2
Rudi lf	4	2	1	2	Duncan c	4	0	0	0
RJackson rf	4	2	1	2	Hendrick cf	4	1	1	1
Johnstone rf	0	0	0	0	Bell 3b	4	0	1	0
DeJohnson dh	3	1	2	4	Cardenas ss	2	0	1	0
Rando 3b	3	0	2	0	Williams ph	1	0	0	0
McKinney 2b	0	0	0	0	Duffy ss	1	0	0	0
Tenace 1b	3	0	0	0	GPerry p	0	0	0	0
Odom pr	0	1	0	0	JJohnson p	0	0	0	0
Kuhlas 3b	1	0	0	0	Farmer p	0	0	0	0
Fosse c	4	1	1	1	Hilgendorf p	0	0	0	0
North cf	4	1	1	0					
Hunter p	0	0	0	0					
Total	39	11	11	9	Total	36	4	8	4

Oakland	3	0	0	0	0	0	1	7	0	— 11
Cleveland	0	0	0	1	0	0	1	0	2	— 4

E—Duncan 2, Lolich, Bell. DP—Cleveland 1. LOB—Oakland 11, Cleveland 3. 2B—Bronaugh, Gamble, D.Green, Hegan. HR—Gamble (3), Hendrick (3). SB—North. SF—R.Jackson.

	IP	H	R	ER	BB	SO
Hunter (W,4-1)	1					
G.Perry (L,3-3)						
J.Johnson						
Farmer						
Hilgendorf						

HBP—by G.Perry (Campaneris). PB—

89ers 6, Royals 3

OMAHA	ab	r	h	bi	OKLA. CITY	ab	r	h	bi
White 2b	3	0	0	0	Flores cf	4	2	1	2
Mashi rf	3	1	1	0	Hermsen ss	5	0	0	2
Pentle rf	3	1	1	0	Alvino 1b	4	0	1	1
Lyttle lf	4	1	2	1	Freed rf	3	0	1	0
Whited dh	2	1	1	0	Camilli 2b	4	0	1	0
Skow 1b	3	0	0	0	Fo lr dh	4	1	1	1
Sierra 3b	3	0	0	0	Hedrick 3b	4	0	0	0
Pa-	1	0	0	1	Pena c	1	1	1	0
Arria ss	3	0	0	1	TSmith lf	3	1	1	0
Autry p	0	0	0	0	Palmer p	0	0	0	0
Chlan	0	0	0	0					
Baird p	0	0	0	0					
Total	28	3	6	2	Total	37	6	10	6

Omaha	0	1	0	0	0	0	0	2	0	— 3
Oklahoma City	1	0	0	0	3	1	1	0	x	— 6

E—Autry, Freed. DP—Oklahoma City 3. LOB—Omaha 7, Okla. City 10. 2B—Camilli, Hermsen. 3B—Flowers, Pruquette. HR—Foster. SB—Marshall. SF—Blanco, Arcia.

	IP	H	R	ER	BB	SO
Autry (L,1-3)	3	7	6	5	4	2
Chlan	3	0	0	0	2	3
Baird	2	3	0	0	1	3
Palmer (W,3-1)	9	6	3	3	2	7

WP—Palmer 2. T—2:36. A—841

Indy 8, Aeros 6

WICHITA	ab	r	h	bi	INDIANAPOLIS	ab	r	h	bi
LaCock rf	3	2	1	1	Armbstr rf	4	1	3	2
LaRosa 2b	3	1	0	0	Sper pr-rf	1	1	1	0
Ward lf	3	1	1	0	Griffy lf	5	2	2	1
Bourque 1b	1	2	1	2	Drsen 3b	5	1	3	1
Porter dh	4	0	1	2	Kosco dh	4	0	1	1
Alexndr 3b	3	1	0	0	Sdmer 1b	5	0	1	0
Rettos ss	4	0	0	0	King c	3	0	1	0
Lundell c	4	0	0	0	Fostr cf	3	1	0	0
Ortiz cf	4	0	0	0	Orsch 2b	4	0	1	0
Rychnl p	0	0	0	0	Young ss	1	2	1	1
Rickey p	0	0	0	0	Andjr p	0	0	0	0
McGinn p	0	0	0	0	Osbern p	0	0	0	0
Rodrgz p	0	0	0	0					
Total	29	6	4	5	Total	35	8	14	6

Wichita	1	0	0	0	0	0	1	0	4	— 6
Indianapolis	0	0	0	0	3	1	1	0	3	— 8

E—Hare. DP—Wichita 2. LOB—Wichita 3, Indianapolis 9. 2B—Armbrister 2. 3B—Driessen. HR—LaCock (4), Bourque (3). SB—Driessen, Young. SF—Bourque, Kosco.

	IP	H	R	ER	BB	SO
Ruroschel	4	9	5	4	0	1
Rickey (L,0-2)	1⅔	3	3	3	1	2
McGinn	1⅓	1	0	0	2	2
Rodriguez	1	0	0	0	1	1
Andujar	1	1	0	0	0	1
Osborn (W,1-2)	4	1	1	1	1	3

HBP—by Ruroschel (Young). PB—Lundstedt, Kim. WP—Ruroschel. T—2:36. A—394.

Chisox 5, Yanks 0

NEW YORK	ab	r	h	bi	CHICAGO	ab	r	h	bi
Clarke 3b	4	0	0	0	PKelly rf	4	0	0	0
White lf	4	0	1	0	CMay lf	3	1	0	0
Maloy rf	4	0	1	0	Dalton 1b	3	0	1	0
Mercer cf	3	0	1	0	Muser 1b	1	0	0	0
GNettles 3b	3	0	0	0	Melton 3b	4	2	1	1
Hart dh	4	0	0	0	Hendrsn cf	4	0	1	0
Blomberg 1b	3	0	1	0	Andrews dh	3	0	1	1
FAlou lf	1	0	0	0	Hrrmann c	3	1	1	1
Munson c	3	0	0	0	Orta 2b	2	0	0	1
Mirhnd ss	2	0	1	0	Leon ss	4	1	2	0
Stottlmyre p	0	0	0	0	Robinsn p	0	0	0	0
Blozmsn p	0	0	0	0	Forster p	0	0	0	0
Total	31	0	5	0	Total	33	5	11	4

New York	0	0	0	0	0	0	0	0	0	— 0
Chicago	1	0	0	3	1	0	0	0	x	— 5

E—Michael 2. DP—New York 1, Chicago 2. LOB—New York 10, Chicago 9. 2B—Blomberg 2, Leon 2, Henderson. SB—Hermann. SF—Orta.

	IP	H	R	ER	BB	SO
Stottlmyre (L,3-4)	4	4	4	4	3	1
Blozmsn	4	3	1	1	1	3
Robinsn (W,6-1)	8	3	0	0	0	3
Forster	1	1	0	0	1	1

[illegible] (4). HBP—by [illegible]

'73 U of DML

National Box Scores

Phils 5, Braves 4

ATLANTA	ab	r	h	bi	PHILADELPHIA	ab	r	h	bi
[illegible]									
Total	34	4	12	4	Total	34	5	9	5

One out when winning run scored.
Braves 002 000 000 000 200 000 00—4
Phillies 000 000 030 000 200 000 01—5

E—Schmidt (Doyle 2, Baker, Lonborg). DP—Atlanta 1. LOB—Atlanta 12, Philadelphia 11. 2B—Evans, Tovar, DeJohnson, Anderson, Lum, Boone. 3B—Doyle. HR—Evans (7), 5 (Kosco). Lum, DeBrown. SB—Unser, Pagan.

	IP	H	R	ER	BB	SO
Reed	7	7	3	1	2	7
Ferrara	3	0	0	0	0	2
P. Jarvis	1	0	0	0	0	0
[illegible]	1	0	0	0	0	0
[illegible]	3	3	1	1	2	4
[illegible]	1	1	0	0	0	1
[illegible]	1	0	0	0	0	0
[illegible]	1	1	0	0	0	0
[illegible]	1	0	0	0	0	1
[illegible]	1	0	0	0	0	0
[illegible]	1	0	0	0	0	0
[illegible]	1	0	0	0	0	0

By Ferrara (Lum), by Twitchell (DeJohnson). WP—Schueler. Balk—Ruthven. PB—Oates. T—2:58. A—10,158.

Expos 6, Reds 3

CINCINNATI	ab	r	h	bi	MONTREAL	ab	r	h	bi
Rose lf	4	0	0	0	Hunt 2b	3	1	3	0
Morgan 2b	4	1	0	0	Foli ss	3	2	1	1
Bench c	4	1	2	1	Jorgensn 1b	4	0	0	1
Yeton cf	4	1	2	2	Fairly rf	3	1	1	2
TPerez 1b	3	0	1	0	Bnaga cf	3	0	0	0
Menke rf	3	0	1	0	Singleton rf	3	0	1	0
Geronimo cf	0	0	0	0	Woods cf	1	0	2	2
Concepcn ss	4	0	0	0	Rocchelli c	4	0	0	0
Menke 3b	3	0	0	0	Bailey 3b	3	1	2	0
Stahl ph	1	0	0	0	Lahoz 3b	0	0	0	0
[illegible]	0	0	0	0	Torrez p	1	0	0	0
[illegible]	2	1	1	0	Gipp ph	0	1	0	0
[illegible]	0	1	1	0	Gray p	1	0	0	0
Schneider ph	1	0	0	0					
Carroll p	0	0	0	0					
Total	32	3	6	3	Total	28	6	9	6

Cincinnati 300 000 000—3
Montreal 000 000 06x—6

E—Labay. DP—Cincinnati 3, Montreal 1. LOB—Cincinnati 9, Montreal 6. 2B—Bailey. HR—Yeton (7), Fairly (4). SB—Morgan, Concepcion 5. Billingham.

	IP	H	R	ER	BB	SO
Billingham (L,4-1)	5 1/3	5	4	4	4	3
Ruebon	1 2/3	2	0	0	0	1
Carroll	1	2	2	2	1	0
Torrez (W,3-3)	6	4	3	3	3	2
Reuss	1	3	0	0	0	1

Save—Reuss (1). HBP—by Torrez (T.Perez), by Billingham (Foli). WP—Torrez. T—3:01. A—10,665.

Giants 5, Cubs 4

CHICAGO	ab	r	h	bi	SAN FRANCISCO	ab	r	h	bi
Monday cf	5	1	1	1	Rondo rf	4	1	1	0
Beckert 2b	4	1	1	0	Fuentes 2b	3	0	1	0
BWilliams lf	4	0	0	0	Speier ss	3	1	1	2
Pepitone 1b	4	2	2	1	McCovey 1b	3	0	0	0
Santo 3b	4	0	0	0	Kingman 3b	4	1	1	1
Cardenal rf	2	0	0	0	Thomasn lf	3	1	1	0
Rudolph c	4	0	2	1	Howarth cf	3	1	0	0
Kessinger ss	2	0	1	0	DeRader c	3	0	0	0
Jenkins p	2	0	0	0	Marichal p	2	0	0	0
Hiser ph	1	0	1	0	Sosa p	0	0	0	0
Benham p	0	0	0	0	Goodson ph	1	0	1	1
AGarrett ph	1	0	0	0	Willghby pr	0	0	0	0
					Merritt p	1	0	0	0
Total	33	4	8	4	Total	28	5	6	5

Chicago 300 010 000—4
SanFrancisco 200 003 00x—5

E—Marichal, Pepitone. DP—SanFrancisco 2. LOB—Chicago 6, SanFrancisco 7. HR—Monday (3), Speier (4), Pepitone (3), Kingman (2). S—Howarth.

	IP	H	R	ER	BB	SO
Jenkins (L,3-3)	6	4	3	3	3	3
Benham	2	0	0	0	1	1
Marichal	3	3	1	1	1	3
Sosa (W,4-0)	1	0	0	0	0	1
Merritt	3	2	0	0	0	3

Save—Merritt (4). HBP—by Jenkins (Speier). T—4:25. A—7,161.

Bucs 12, Padres 6

PITTSBURGH	ab	r	h	bi	SAN DIEGO	ab	r	h	bi
[illegible]									
Total	36	12	13	11	Total	34	6	7	6

Pittsburgh 010 000 003 212—12
San Diego 010 000 000 032—6

E—Metzger, Wynn, Hennigan. DP—Houston 1, New York 1. LOB—Houston 10, New York 11. 2B—T.Martinez, Staub, DeRader. 3B—Watson. HP—Cedeno (3). SB—Cedeno, S. W.Garrett.

	IP	H	R	ER	BB	SO
Blass (W,2-1)	9	7	6	6	4	4
Pierman (L,0-1)	3 1/3	8	5	5	1	1
Reis	2/3	1	1	1	2	0
Arlin	2	1	2	2	3	1
Trevlin	1	2	2	2	2	0

HBP—by Blass (Grubb). WP—Arlin. T—2:31. A—8,595.

L.A. 6, Cards 5

ST LOUIS	ab	r	h	bi	LOS ANGELES	ab	r	h	bi
[illegible]									
Total	38	5	10	4	Total	35	6	13	6

One out when winning run scored.
St Louis 000 010 004—5
Los Angeles 000 013 00x—6

E—Simmons, Kelleher, J.Cruz. DP—Los Angeles 1. LOB—St. Louis 9, Los Angeles 12. 2B—Mr.Mndez, Tyson, Russell. 3B—Cey. SB—Lopes 3. Metzger.

	IP	H	R	ER	BB	SO
Wise	8 1/3	13	5	4	1	4
Segui (L,0-2)	1	3	1	1	0	1
Osteen	4 2/3	6	3	3	2	4
Hough	1 1/3	1	0	0	1	2
Culver	2	2	0	0	0	0
Brewer (W,3-1)	2	1	0	0	1	1

HBP—by Osteen (Kelleher). WP—Osteen, Hough. T—3:00. A—34,187.

Astros 9, Mets 5

HOUSTON	ab	r	h	bi	NEW YORK	ab	r	h	bi
Wynn rf	7	2	1	0	TMartnz cf	7	0	1	2
Metzger ss	4	1	1	0	Millan 2b	7	0	2	0
JCrawford p	0	0	0	0	WGarrett 3b	4	0	0	0
Upshaw p	0	0	0	0	Staub rf	5	1	1	0
Edwards ph	1	0	0	0	Krangel 1b	1	2	0	0
York p	0	0	0	0	Beaucha ph	0	0	0	0
Gallanhr ph	1	0	0	0	Boswell ph	1	0	0	0
JRay p	1	1	1	0	Theodore 1b	2	0	0	0
Gladding p	0	0	0	0	Geiger lf	3	1	0	0
Cedeno cf	7	3	4	1	Parker p	0	0	0	0
Watson lf	3	1	1	2	Grote c	4	1	2	1
LMay 1b	4	0	0	0	Harrelson ss	4	0	0	0
Torres ss	3	0	0	0	Koosman p	3	0	0	1
DeRader 3b	4	0	3	4	McGraw p	0	0	0	0
Howard c	4	0	0	1	Hennigan p	2	0	1	0
Helms ph	1	0	0	0	Pregosi 1b	0	0	0	0
Forsch p	1	0	0	0					
Stewart ph	1	0	0	0					
Griffin p	0	0	0	0					
Asse lf	4	1	1	0					
Total	53	9	13	9	Total	49	5	8	4

Astros 000 300 030 000 6—9
Mets 040 001 000 000 0—5

E—Metzger, Wynn, Hennigan. DP—New York 1. LOB—Houston 10, New York 11. 2B—T.Martinez, Staub, DeRader. 3B—Watson. HP—Cedeno (3). SB—Cedeno, S. W.Garrett.

	IP	H	R	ER	BB	SO
Forsch	4	1	1	1	3	3
Griffin	3	1	1	1	1	3
J.Crawford	1-3	1	0	0	0	0
Upshaw	3-3	0	0	0	1	0
York	2	2	2	2	1	1
J.Ray (W,3-4)	1	1	0	0	0	0
Gladding	1	1	0	0	0	0
Koosman	7 1-3	7	3	3	1	6
McGraw	1-3	0	0	0	0	1
Hennigan (L,0-2)	0 2-3	3	1	1	1	1
Parker	1	0	0	0	0	1

Save—Gladding (1). T—4:02. A—17,269.

Baseball Standings

AMERICAN ASSOCIATION

WESTERN DIVISION

	W	L	Pct.	GB
[illegible]	11	9	.550	
[illegible]	8	7	.533	1½
[illegible]	9	11	.450	3
[illegible]	8	11	.421	3½

EASTERN DIVISION

	W	L	Pct.	GB
[illegible]	14	7	.588	
[illegible]	11	8	.579	2
[illegible]	11	9	.550	2½
[illegible]	6	12	.333	6½

FRIDAY'S GAMES
DENVER 10, Evansville 6
[illegible]
[illegible]
Oklahoma City 4, Tulsa 1
Indianapolis 9, Wichita 5

SATURDAY'S GAMES
Evansville at DENVER
Iowa at Tulsa
Omaha at Oklahoma City
Wichita at Indianapolis

AMERICAN LEAGUE

EAST

	W	L	Pct.	GB
Detroit	11	17	.579	
Milwaukee	19	11	.576	
Baltimore	18	12	.600	½
New York	18	12	.600	½
Cleveland	19	13	.594	½
Boston	17	17	.500	3½

WEST

	W	L	Pct.	GB
[illegible]	22	7	.759	
[illegible]	21	9	.700	1½
[illegible]	17	9	.654	3
[illegible]	17	13	.567	5½
Oakland	11	17	.478	9½
Texas	7	17	.368	11½

FRIDAY'S GAMES
California 1, Baltimore 0
Oakland 11, Cleveland 4
Detroit 5, Texas 1
Kansas City 5, Milwaukee 3
Minnesota 9, Boston 6
Chicago 5, New York 0

SATURDAY'S GAMES
Baltimore at Minnesota (Palmer 2-4)
New York (Peterson 2-1) at Chicago (Fisher 2-1), night
Kansas City (Simpson 2-2) at Milwaukee (Parsons 1-2).
Texas (Stanhouse 0-3) at Detroit (Coleman 3-1).
Oakland (Odom 0-5) at Cleveland (Willcox 1-0), night
California (Wright 1-4) at Baltimore (Cuellar 1-3), night

SUNDAY'S GAMES
Oakland at Cleveland, 2.
Texas at Detroit
California at Baltimore.
New York at Chicago
Kansas City at Milwaukee.
Boston at Minnesota.

NATIONAL LEAGUE

EAST

	W	L	Pct.	GB
Pittsburgh	11	7	.611	
Chicago	13	10	.565	1½
New York	12	11	.522	2½
Montreal	10	11	.476	3½
Philadelphia	10	11	.476	3½
St. Louis	3	17	.222	9½

WEST

	W	L	Pct.	GB
San Francisco	20	8	.714	
Houston	17	10	.630	3½
Cincinnati	15	9	.625	3
Los Angeles	13	12	.520	5
San Diego	12	13	.480	6
Atlanta	7	16	.304	10½

FRIDAY'S GAMES
Philadelphia 5, Atlanta 4, 20 innings.
Houston 9, New York 5, 14 innings.
Montreal 6, Cincinnati 3.
Pittsburgh 12, San Diego 6.
San Francisco 7, Chicago 4.
Los Angeles 6, St. Louis 5, 10 innings.

SATURDAY'S GAMES
Houston (Wilson 1-3) at New York (McAndrew 2-2).
Cincinnati (Gullett 3-2) at Montreal (Renko 1-7).
Chicago (Hooton 5-2) at San Francisco (Bryant 3-1).
Atlanta (Morton 1-2) at Philadelphia (Carlton 4-3), night.
Pittsburgh (Ellis 3-1) at San Diego (Corkins 2-2), night.
St. Louis (Rasmussen 0-0) at Los Angeles (John 3-1), night.

SUNDAY'S GAMES
Atlanta at Philadelphia.
Houston at New York.
Cincinnati at Montreal.
Chicago at San Francisco, 2.
Pittsburgh at San Diego.
St. Louis at Los Angeles.

'73 U of DML

Major Averages

By THE ASSOCIATED PRESS
Complete through games of Friday

American League

INDIVIDUAL BATTING

	AB	R	H	HR	RBI	Pct
[illegible]	61	18	30	0	6	.492
[illegible]	82	19	32	1	11	.390
[illegible] KC	68	12	25	1	16	.368
Hall Min	58	8	19	1	9	.328
Tullis Bos	32	4	12	1	4	.375
Hamm NY	78	11	29	2	18	.372
W Horton Det	54	11	19	4	11	.352
Pick Bos	62	10	24	4	11	.348
F Robinson Mil	16	4	6	0	1	.346
Stanleycon Chi	70	12	24	1	7	.343
Tresh Det	76	12	26	4	12	.342
R Johnson Tex	78	5	26	1	9	.333
Andrews Chi	51	7	17	0	5	.333
Peter Chi	51	6	17	0	5	.333
Freehan Det	80	7	26	0	9	.325
M Alou NY	69	12	19	1	6	.325
Perry Cle	13	2	14	0	4	.314
D Allen Chi	67	11	21	1	12	.313
Wallace Det	48	7	15	0	7	.313
Pena KC	94	17	30	1	14	.313
Jo J NY	51	5	16	0	6	.313
Cattaneo Cal	48	7	15	0	5	.313
Chevilaro Oak	60	7	17	0	5	.300
Keeley Tex	54	9	16	1	4	.296
Kraus Min	61	11	18	1	9	.295
Schaal KC	85	9	25	0	9	.294
Oliva Min	75	15	22	4	8	.293
Blanchard NY	41	5	12	0	8	.293
Clarke NY	84	7	25	0	8	.291
Melton Chi	66	14	19	4	12	.288
Mincher NY	80	11	23	4	14	.288
Otis KC	101	19	29	4	13	.287
Harrah Tex	74	7	21	0	5	.284
Burroughs Tex	67	5	19	4	12	.284
Foyle Oak	82	7	23	0	8	.280
Griffin Bos	72	10	20	1	7	.278
Harper Bos	72	12	20	1	6	.278
W Smith Bos	72	13	20	3	11	.278
A May Chi	72	8	20	3	12	.278
Kubek Oak	14	1	10	1	4	.278
Aparicio Cle	87	9	24	1	9	.276
W Davis Bal	51	3	14	0	4	.275
Gamble Cle	51	7	14	1	4	.275
B Oliver Cal	44	3	12	2	7	.273
Taylor KC	33	4	9	0	5	.273
Pinella KC	81	10	22	1	11	.272
Pepitone Chi	92	11	25	1	13	.272
F Robinson Cal	54	9	14	2	12	.259
Oliva Min	14	4	14	1	2	.248
Smith Bal	83	8	22	1	3	.265
Fregosi Mil	68	11	18	4	9	.265
Spencer Cal	66	4	17	0	4	.261
Taylor Bal	85	11	22	2	7	.259
Briggs Mil	67	10	17	2	5	.254
R Jackson Oak	87	11	22	4	11	.253
Petek KC	95	21	24	1	5	.253
Petrocelli Bos	60	11	15	4	14	.250
Ellis Cle	60	3	10	0	3	.250
Michael NY	65	7	16	1	7	.246
Thompson Min	61	4	15	0	7	.246
Chris Cle	57	10	14	0	6	.246
Nossman Chi	45	6	11	2	7	.244
Mayberry KC	86	19	21	6	19	.244
Romero Oak	78	14	19	7	15	.244
Agarwin Bos	74	8	18	0	5	.243
Carew Min	62	11	15	1	8	.242
Stephenson Cal	29	3	7	0	0	.241
Spikes Cle	75	13	18	6	12	.240
Pinson Cal	59	6	12	1	10	.240
Buhl Oak	94	11	23	3	10	.240
M Stanley Det	71	10	17	3	10	.239
McCraw Cal	46	2	11	1	4	.239
Tettenmund Bal	80	10	19	1	10	.238
F Alou NY	93	6	19	2	7	.234
Manuel Oak	51	7	12	2	4	.235
Blair Bal	78	8	18	0	2	.231
D Evans Bos	65	5	15	1	8	.231
Buchanan Cle	67	5	15	3	9	.224
Scott Mil	80	10	18	3	9	.225
Yastrzemski Bos	76	9	17	3	15	.224
Campaneris Oak	76	8	17	0	3	.224
R Robinson Bal	85	4	19	3	9	.224
Runnels Cle	81	6	18	1	5	.222
F Robinson Det	72	8	16	1	4	.222
Pappas Mil	34	3	8	1	4	.222
Walton Det	68	8	15	2	9	.221
D Nelson Tex	64	10	14	2	9	.219
White NY	87	8	19	0	7	.218
Belanger Bal	78	5	17	0	7	.218
Darwin Min	69	9	15	2	12	.217
O'Brien Mil	51	4	11	1	5	.216
Epstein Tex	51	5	11	1	5	.216
Maxey Mil	70	5	15	2	9	.214
Stanton Cal	42	3	9	1	2	.214
D May Mil	89	9	19	5	16	.213
T Taylor Det	38	3	8	1	3	.211
Nenin Oak	76	11	16	0	3	.211
McAuliffe Det	64	7	13	4	5	.203
J Powell Bal	65	7	17	1	8	.262
Cosman Bal	33	3	7	0	3	.212
T Howard Det	30	3	6	0	3	.200
Lynn Chi	60	7	12	1	4	.200
Watton Min	21	6	4	0	2	.200
D Green Oak	70	7	14	0	5	.197
Almonar Cal	71	7	14	0	5	.197
Porter Mil	41	5	8	1	6	.195
Cash Det	67	11	13	3	6	.194
R Torres Cle	54	5	10	1	4	.185
Killebrew Min	49	6	9	1	4	.184
E Williams Bal	77	11	14	3	11	.182
Billings Tex	33	3	6	0	4	.182
G Scott NY	73	12	13	4	12	.178
A Rodriguez Det	90	7	16	0	5	.178
G Brown Det	51	6	9	1	3	.176
McRae KC	68	6	12	2	10	.176
Bell Cle	74	6	13	0	1	.176
Carty Tex	63	7	11	1	5	.175
Edwards Mil	33	3	6	0	3	.171
Horlen Tex	40	3	7	0	3	.167
[illegible]	61	5	10	0	3	.164
Cullison NY	31	0	5	0	3	.161
Cardenas Cle	75	6	12	0	3	.160
J May KC	74	6	11	0	2	.154
Cullin Tex	31	3	5	0	0	.152
Scherbarsky Cal	61	6	9	1	2	.150
Chambliss Cle	75	7	11	1	6	.147
Calmus Mil	33	5	4	0	3	.141
Kubach Mil	54	3	7	1	3	.130
Rosso Det	14	2	2	0	0	.143

PITCHING

	IP	H	RA	SO	W	L	ERA
Wood Chi	64	48	10	76	6	2	1.13
D May Cal	33	19	8	18	4	1	1.36
Pina Oak	33	31	7	19	3	1	1.91
McNally Bal	53	36	13	38	4	2	1.97
Hoffman Oak	33	15	12	30	4	2	1.98
Singer Cal	61	32	15	58	4	3	2.06
Wilson Mil	39	17	11	6	3	1	2.13
J Perry Det	41	32	11	16	3	2	2.18
Gaster KC	27	28	9	11	3	1	2.19
Coleman Det	47	47	9	38	4	1	2.20
N Ryan Cal	53	44	18	61	4	1	2.42
L Perry Cle	51	48	16	46	3	4	2.66
Slaton Mil	39	32	13	6	3	2	2.67
Parnes Mil	11	8	11	1	1	2	2.77
Krall Bal	4	4	4	2	2	2	2.86
Stottlemyre NY	47	34	16	27	3	4	2.90
Paul Tex	24	24	6	14	3	0	2.92
P Peterson NY	32	28	9	13	2	3	2.96
Wegman Mil	14	10	5	7	2	1	2.87
Splittorff KC	46	40	15	19	4	1	2.87
Blyleven Min	44	31	17	34	2	4	2.89
Palmer Bal	33	26	11	21	2	2	2.79
Rohasen Chi	33	42	21	13	4	1	2.73
Lolich Det	59	48	19	32	1	3	2.58
Kline NY	27	28	13	5	2	2	2.58
Tiant Bos	42	36	14	31	3	2	2.59
Bell Mil	37	33	23	13	3	2	2.62
Lockwood Mil	22	24	11	15	1	2	2.68
Bosman Tex	39	37	17	14	2	4	2.69
Medich NY	31	29	8	21	2	1	2.69
Sands Min	32	31	4	17	2	2	2.94
McGrew Det	30	15	8	8	0	3	2.98
Hunter Oak	48	47	13	33	2	1	4.10
Simpson KC	37	33	19	3	2	2	4.34
Wright Cal	31	38	6	9	0	4	4.35
Tidrow Cle	37	31	14	19	3	3	4.38
Freyman Det	24	29	7	16	2	1	4.44
Kaat Min	34	44	6	23	4	1	4.70
Busby KC	39	27	17	20	3	2	4.75
Cuellar Bal	44	41	15	30	1	3	4.87
E Fisher Chi	17	21	7	9	2	1	5.29
Stanhouse Tex	14	19	10	9	0	3	6.19
Odom Oak	33	28	21	16	0	3	6.21
Brabory Tex	24	25	15	8	0	3	6.93
McGlothen Bos	14	24	7	7	0	1	8.66
Pattin Bos	18	25	18	11	0	1	9.00
Drago KC	15	24	16	10	0	1	9.16

National League

INDIVIDUAL BATTING

	AB	R	H	HR	RBI	Pct
Woods Mil	30	4	12	0	4	.400
Madlock SF	79	12	34	1	9	.392
Purdy Mil	58	11	19	4	9	.339
Mota LA	65	5	16	0	3	.337
Santo Chi	85	14	31	4	11	.347
Cannizzaro Pgh	26	15	10	1	4	.333
Darnell Pgh	66	19	27	7	16	.326
Watson Hou	96	17	31	4	21	.323
Lopez LA	38	4	11	0	4	.289
Cardenal Chi	85	29	29	9	16	.341
Temperton Cin	71	17	24	2	18	.333
Hund Mil	60	13	20	5	4	.333
Anderson Phi	35	8	11	2	4	.333
Sizemore StL	54	6	18	0	4	.333
Millner NY	42	11	17	5	11	.333
Campbell SD	63	2	14	0	6	.326
Speolman SF	76	8	24	1	11	.324
A Oliver Pgh	70	15	25	4	21	.316
Matthews SF	54	3	17	0	1	.315
M May Pgh	70	8	22	3	13	.314
Marshall SD	32	3	10	0	2	.313
Morgan Cin	87	18	27	4	17	.310
Foster SF	120	14	37	1	8	.308
Torre StL	78	9	24	3	10	.308
Rollins SD	75	12	23	3	9	.307
Cedeno Hou	101	15	32	3	10	.304
Ferguson LA	69	14	21	3	14	.304
Grubb SD	64	8	20	0	3	.301
Maulay Chi	76	14	23	3	10	.303
Melender StL	63	5	13	0	3	.302
R Robertson Pgh	73	17	22	3	10	.301
Rose Cin	98	15	27	1	8	.300
Kendall SD	77	8	23	1	11	.299
Lee SD	95	9	28	1	9	.295
Bonds SF	122	24	36	5	18	.295
Baker Atl	66	13	25	2	7	.291
T Perez Cin	86	11	25	3	11	.291
Singleton Mil	69	13	20	3	10	.290
Hebner Pgh	72	12	21	2	10	.288
Cash Pgh	36	11	16	1	7	.286
Agee Hin	42	4	12	0	0	.286
Baccabella Mil	68	3	17	0	8	.281
T Martinez NY	66	6	13	0	4	.281
Lum Atl	46	5	13	2	7	.283
Beckert Chi	78	3	22	0	9	.282
W Robinson Phi	57	9	16	1	7	.281
Tolan Cin	98	9	25	2	16	.278
Kessinger Chi	76	5	21	0	8	.276
Kranepool NY	29	5	8	0	4	.276
Colbert SD	98	10	27	1	12	.276
Gilbreath Atl	64	5	18	0	7	.273
Pepitone Chi	74	11	20	2	12	.270
DeJohnson Atl	89	7	24	2	6	.270
Bowa Phi	98	8	24	0	8	.267
McCovey SF	75	19	20	6	11	.267
W.Davis LA	109	16	29	6	18	.266
Sorier SF	113	16	30	4	15	.265
Oates Atl	87	7	23	2	6	.264
Brock StL	93	11	25	1	10	.263
Doyle Phi	87	8	11	0	7	.262
Cey LA	77	5	20	1	10	.260
R Williams Chi	93	13	24	1	10	.258
Buckner LA	113	13	29	2	8	.257
Grote NY	39	3	10	0	3	.256
Tover Phi	67	7	17	0	3	.255
Wynn Hin	107	24	27	0	17	.252
Unser Phi	36	2	9	0	3	.250
Evans Atl	88	13	22	7	19	.250
Russell LA	108	9	26	0	3	.245
C.Jones NY	37	4	9	2	6	.243
W Crawford LA	83	9	20	0	3	.241
Alley Pgh	80	7	12	2	8	.240
Thomasson SF	67	7	16	2	10	.239
M.Perez Atl	60	4	14	1	8	.233
Theodore NY	30	1	6	0	3	.231
Harmon Phi	26	3	6	0	3	.231
J.Cruz StL	63	10	19	3	9	.229
Helms Hin	106	9	24	0	9	.226
Schmidt Phi	40	1	9	1	3	.225
Simmons StL	80	5	18	0	7	.225
Stennett Pgh	54	5	12	3	11	.222
Geronimo Cin	72	10	16	1	5	.222
Garvey LA	41	0	9	0	1	.220
DeRader Hin	96	11	21	5	16	.219
D.Thomas SD	35	6	17	0	3	.218
Edwards Hin	60	6	13	0	9	.217
Boone Phi	60	4	13	0	3	.217
Brias Mil	37	4	8	0	3	.216
McCarver StL	32	2	7	0	3	.212
Luzinski Phi	71	5	15	0	1	.211
Montanez Phi	81	4	17	1	13	.210
Bench Cin	81	10	17	4	12	.210
Foli Mil	66	10	10	1	0	.209
Lacy LA	67	5	14	0	3	.209
Menke Cin	53	3	11	0	4	.208
Bailey Mil	29	3	6	1	4	.207
Hilton SD	88	10	18	2	10	.205
DuRader SF	93	12	19	0	6	.204
Harrelson NY	74	4	15	0	1	.203
W Garrett NY	40	2	8	0	2	.200
L May Hin	97	7	19	1	7	.197
Milton NY	92	9	18	0	3	.196
Morales SD	46	4	9	0	1	.196
Fregosi NY	20	1	7	0	2	.194
Garr Atl	104	6	20	0	2	.192
E Hernandez SD	87	3	11	0	4	.190
Jorgensen Mil	80	3	11	1	4	.183
H Aaron Atl	67	12	12	2	11	.179
Kelly StL	89	3	16	0	3	.179
Staub NY	89	9	16	3	6	.180
Kingman SF	87	7	15	2	7	.172
DeJohnson Phi	36	3	6	1	4	.167
Carbo StL	37	1	6	0	2	.162
Pocloroh LA	31	1	5	0	2	.161
Hundley Chi	69	3	10	1	3	.159
Roque Mil	44	2	7	0	4	.159
Crosby StL	82	7	13	0	3	.154
Howard Hin	52	3	8	0	3	.147
Hickman Chi	34	2	5	0	1	.147
Chiles NY	33	3	5	0	1	.139
Dyer NY	43	2	6	0	1	.139
Sosso StL	46	2	6	0	1	.130
Kaye KC	46	3	6	0	1	.130
[illegible]	14	0	1	0	0	.071

PITCHING

	IP	H	RA	SO	W	L	ERA
Carroll SD	28	15	7	19	1	2	1.96
Grimsley Chi	14	11	7	22	2	1	2.25
Rose SF	42	30	9	12	3	2	1.69
Reuss Hin	48	31	20	14	4	1	1.98
Sutton LA	51	38	9	40	3	2	1.99
Seaver NY	51	25	11	41	3	2	1.99
Bryant SF	47	19	12	17	3	1	2.72
Bradley SF	20	19	8	12	2	1	2.74
Kaab Hin	29	19	6	10	2	1	2.77
Lonz SF	10	6	3	7	0	1	2.80
Culpett Cin	47	35	13	27	3	2	2.90
Kaufman NY	41	29	8	28	4	0	2.96
Kolmsley Cin	45	47	18	18	4	1	2.56
Bradley Phi	59	44	15	44	4	3	2.57
Cubas StL	48	46	13	32	3	2	2.63
Morton Atl	57	37	9	25	3	2	2.68
Brewer LA	13	9	5	6	2	1	2.70
Downing LA	24	22	7	12	2	1	2.78
J Walker Mil	13	13	2	13	1	2	2.77
Ellis Pgh	31	24	15	21	3	1	2.87
Wise StL	99	51	8	15	3	1	2.88
Renko Mil	21	15	7	10	1	2	2.91
Marichal SF	46	47	11	35	4	2	2.93
Moose Pgh	12	24	12	20	2	1	2.96
Billingham Cin	58	44	14	30	4	1	2.70
Lersey Mil	45	39	33	29	3	3	3.20
Cleveland StL	59	37	8	23	3	3	3.21
John LA	25	19	11	19	2	2	3.24
McGlenthlin LA	41	41	11	35	3	3	3.28
Osteen LA	12	10	9	15	2	2	3.43
DaRonaris Hin	39	49	7	17	3	3	3.43
Gentry Atl	60	39	15	29	2	2	3.82
Norman SD	39	37	15	22	0	4	3.92
Briles Pgh	33	33	9	11	1	2	4.05
Wilson Hin	41	39	19	24	1	3	4.14
Forsch Hin	45	47	15	30	3	1	4.14
Jenkins Chi	47	48	11	31	2	3	4.18
Willoughby SF	43	44	11	21	2	2	4.57
Matlack NY	38	39	29	30	2	4	4.66
Dobson Atl	34	40	18	10	2	3	4.76
Reed Atl	35	36	18	18	0	4	4.79
Caldwell SD	14	19	6	12	0	3	4.86
Pappas Chi	31	40	5	12	1	3	4.88
McAndrew NY	30	19	7	8	2	2	5.40
Marshall Mil	19	22	14	12	2	2	5.59
Hooton Chi	25	23	7	15	2	2	5.68
Christenson Phi	17	23	12	5	1	2	5.71
Hall Cin	11	9	7	9	2	1	5.73
Lonborg Phi	30	34	14	17	2	4	6.60
Corkins SD	19	19	12	14	2	2	6.63
Spinks StL	22	25	16	13	0	4	7.13
Kirby SD	24	38	18	14	1	0	7.88
R.Hernandez Pgh	5	10	5	1	1	0	10.13

*NOTE: These statistics are usually in the Sunday paper.

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TEAM	GAMES WON	TOTAL	PERCENT

PLAYER	AT BATS	HITS	PERCENT

PITCHER	INNINGS PITCHED	ERA	RUNS GIVEN UP EACH GAME

PITCHER	INNINGS PITCHED	ERA	RUNS GIVEN UP EACH GAME

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Use the Official Baseball Rules to draw a diagram of home plate. If the two sides coinciding with the foul lines are 12" long, use the Pythagorean Theorem to find the width. (i.e. width of the strike zone.)

Why is it easier for a left-handed batter to get to first base than a right-handed batter?

Using the Pythagorean Theorem, calculate the distance between first base and the third base.

Make a scale drawing of a playing field. Indicate the scale used and label the distances.

What is the diameter of the largest baseball allowed for official play?

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What is the strike zone? Is it a linear distance, an area, or a volume? Prove your answer and complete the appropriate measure of the strike zone using 33" as the distance from armpit to the top of the kneecap.

What is the height of <u>your</u> strike zone? Find out that information for all others in class of your sex and find the average. How does your strike zone height compare to the average?

If you agree to use 33" as the height of the strike zone, what area does the pitcher have to throw a strike? (Be careful! Trick question!)

Draw the area of the strike zone using 33" as the height on a large piece of paper. Attach the paper to a wall or backstop outside so the bottom of the strike zone corresponds to the top of your knees. Stand back 60'6" and attempt to throw strikes, throwing exactly 6 times. (You may have 3 warmup pitches.) All of the class or just part may participate. Complete page 5A.

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A strike zone is . . .

Name of Pitcher	Strike	Strikeouts	Percent
otals for All			

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What is the area of the infield? (See 6A) What is the area in square yards?

What is the area of the pitcher's circle? What is the area of the batter's box?

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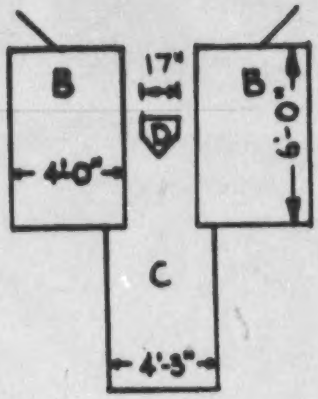

B - BATTER'S BOX

C - CATCHER'S BOX

D - HOME PLATE

DIAGRAM A

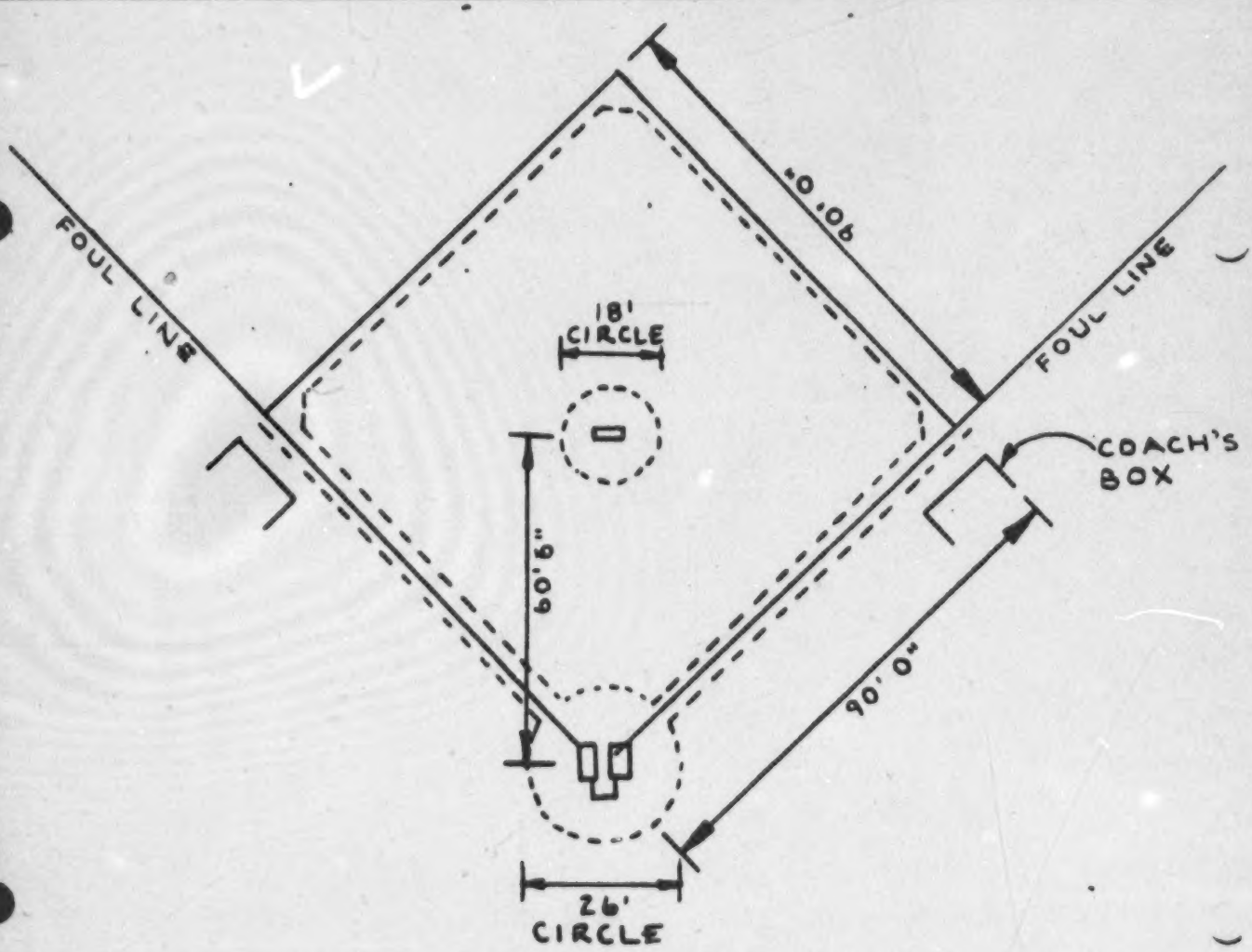

DIAGRAM B

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Examine pages 7A, 7B, 7C, 7D and 7E.

Use 7F for collecting the information.

Which ball park(s) schedule(s) all its games during the day?
Which ball park has the greatest capacity? the least capacity?

The shortest distance a ball could travel for a home run would be the hypotenuse of the right triangle determined by the distance to the fence and the height of the wall i.e.

What is the minimum distance for a home run in left field at Yankee Stadium? at Fenway Park?

Choose two ball parks and compare the minimum distances for home runs hit to left field with those hit to right field.

Record your findings.

If you were a right hand power hitter, in what park would you like to play in? What if you were a left handed hitter?

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CLUB DIRECTORIES, PARK DATA, GAME TIMES, TIME ZONES

7A

ATLANTA Braves

Atlanta Braves, Inc.

Office: Atlanta Stadium
Atlanta, Georgia 30312

Telephone (A.C. 404):
872-7630

Teletype 810-751-9912

GAMES AT: Atlanta Stadium
Capacity: 52,744

Playing field distances:
Left field fence ..... 330 feet
Center field fence ..... 400 feet
Right field fence ..... 330 feet
Plate to grandstand ..... 60 feet

Height of walls:
Left field ..... 6 feet
Right field ..... 6 feet

Game times:
Day games ..... 2:15 p.m.
Day doubleheaders ..... 1:05 p.m.
Twi-night doubleheaders ..... 6:05 p.m.
Night games ..... 8:05 p.m.
Saturday night games ..... 7:05 p.m.

(Eastern Daylight Time
April 29 to end of season)

CHICAGO Cubs

Chicago National League Ball Park

Office: Wrigley Field, Clark and Addison Streets
Chicago, Illinois 60613

Telephones:
Administrative Offices:
(312) 281-5050
Information & Services:
(312) 327-1919

Teletype: 910-221-4703

GAMES AT: Wrigley Field, Clark and Addison Streets
Capacity: 37,741

Playing field distances:
Left field fence ..... 355 feet
Center field fence ..... 400 feet
Right field fence ..... 353 feet
Plate to grandstand ..... 60.5 feet

Height of walls:
Left and right field ..... 11½ feet

Game times:
Single—
Mon. thru Fri. ..... 1:20 p.m.
Single—Sat. & Sun. ..... 1:15 p.m.
All doubleheaders ..... 12:20 p.m.

(Central Daylight Time
April 29 to end of season)

CINCINNATI Reds

The Cincinnati Reds, Inc.

Office: 100 Riverfront Stadium
Cincinnati, Ohio 45202

Telephone (A.C. 513):
421-4510

GAMES AT: Riverfront Stadium
Capacity: 51,726

Playing field distances:
Left field fence ..... 330 feet
Center field fence ..... 404 feet
Right field fence ..... 330 feet
Plate to grandstand ..... 51 feet

Height of walls:
Outfield fence ..... 12 feet

Game times:
Opening game ..... 2:30 p.m.
Weekday nights ..... 8:05 p.m.
Saturday nights ..... 7:00 p.m.
Sat., Sun. & afternoon single games ..... 2:15 p.m.
Sun. doubleheaders ..... 1:15 p.m.
Twi-night doubleheaders ..... 5:30 p.m.
April 25, May 17 ..... 12:30 p.m.
May 28 ..... 12 noon
July 4 ..... 11:00 a.m.
July 27 ..... 3:00 p.m.
Sept. 18 ..... 5:00 p.m.

(Eastern Daylight Time
April 29 to end of season)

HOUSTON Astros

The Houston Sports Association

Offices: Astrodome
P. O. Box 288
Houston, Texas 77001

Telephone (A.C. 713):
RIverside 8-4500

Teletype: 910-881-1740

GAMES AT: The Astrodome
Houston, Texas
Capacity: 45,000

Playing field distances:
Left field ..... 330 feet
Center field ..... 400 feet
Right field ..... 330 feet
Plate to grandstand ..... 60 feet

Height of walls:
All ..... 12 feet

Game times:
All night games ..... 7:30 p.m.
Saturday day games ..... 1:15 p.m.
Sunday day games ..... 2:00 p.m.
Twi-night doubleheaders ..... 5:30 p.m.

(Central Daylight Time
April 29 to end of season)

LOS ANGELES Dodgers

Los Angeles Dodgers, Inc.

Office: Dodger Stadium
1000 Elysian Park Ave.
Los Angeles, California
90012

Telephone (A.C. 213):
225-1411

Teletype: 910-321-6774

GAMES AT: Dodger Stadium
1000 Elysian Park Ave.
Capacity: 56,000

Playing field distances:
Left field ..... 330 feet
Center field fence ..... 395 feet
Right field ..... 330 feet
Plate to grandstand ..... 75 feet

Height of walls:
Outfield fence ..... 8 feet

Game times:
Night games (Mon.-Fri.) ..... 8 p.m.
Night games (Saturdays) ..... 7 p.m.
Twi-night doubleheaders ..... 5 p.m.
Saturday day games ..... 1 p.m.
Sunday games ..... 2 p.m.

(Pacific Daylight Time
April 29 to end of season)

MONTREAL Expos

Montreal Baseball Club Ltd.

Address: P.O. Box 500
Station R
Montreal 326,
Quebec, Canada

Telephone (A.C. 514):
273-9433

Teletype: 610-421-3733

GAMES AT: Jarry Park
St. Laurent Blvd. and Jarry St.
Capacity: 28,000

Playing field distances:
Left field fence ..... 340 feet
Center field fence ..... 417 feet
Right field fence ..... 340 feet
Plate to grandstand ..... 60 feet

Height of wire fences: all 8 feet

Game times:
Day games ..... 2:15 p.m.
Day doubleheaders ..... 1:33 p.m.
Twi-night doubleheaders ..... 6:03 p.m.
Night games ..... 8:06 p.m.
Twilight games,
May 4, 7, 8, 17 & 18 ..... 6:00 p.m.
Twilight games,
May 26 & Sept. 18.. 5:00 p.m.

(Eastern Daylight Time
April 29 to end of season)

NEW YORK Mets

Metropolitan Baseball Club, Inc.

Office: Shea Stadium
126th St. & Roosevelt Ave.
Flushing, N. Y. 11368
Telephone: (A.C. 212):
672-2000
Bus. off.: 672-2000
Ticket-game info.:
672-3000
Teletype: 710-582-2496

GAMES AT: Shea Stadium
As above
Capacity: 55,300

Playing field distances:
Left field ..... 341 feet
Center field ..... 410 feet
Right field ..... 341 feet
Plate to grandstand ..... 80 feet

Height of walls:
All ..... 8 feet

Game times:
Single day games (Sun.-Fri.) ..... 2:05 p.m.
Single day games (Sat.) ..... 2:15 p.m.
Day Doubleheaders ..... 1:05 p.m.
Night games ..... 8:05 p.m.
Twi-night Doubleheaders ..... 5:35 p.m.
Sept. 21 ..... 7:05 p.m.

PHILADELPHIA Phillies

Philadelphia National League Club

Office: Veterans Stadium, Broad Street and Pattison Ave.
Philadelphia, Pa. 19148

Telephone: (A.C. 215):
HO 3-4600

GAMES AT: As above
Capacity: 65,730

Playing field distances:
Left field ..... 330 feet
Center field ..... 408 feet
Right field ..... 330 feet
Plate to grandstand ..... 60 feet

Height of walls:
All ..... 12 feet

Game times:
Night games ..... 7:35 p.m.
Single day games ..... 1:35 p.m.
Day doubleheaders ..... 1:05 p.m.
Twi-night doubleheaders ..... 5:35 p.m.

PITTSBURGH Pirates

Pittsburgh Athletic Co., Inc.

Office: Three Rivers Stadium,
600 Stadium Circle,
Pittsburgh, Pa. 15212
Telephone: (A.C. 412):
323-1000

GAMES AT: As above
Capacity: 50,230

Playing field distances:
Left field ..... 340 feet
Center field ..... 410 feet
Right field ..... 340 feet
Plate to grandstand ..... 60 feet

Height of walls:
All ..... 10 feet

Game times:
Night games ..... 8:05 p.m.
Saturday night games 7:05 p.m.
Twi-night doubleheaders ..... 6:05 p.m.
Doubleheaders ..... 1:05 p.m.
Sept. 3 doubleheader ..10:35 a.m.
Opening day and Sunday single games ..... 1:35 p.m.
Saturday afternoon games ..... 2:15 p.m.
May 28 ..... 11:05 a.m.

ST. LOUIS Cardinals

St. Louis National Baseball Club, Inc.

Office: Busch Memorial Stadium
250 Stadium Plaza
St. Louis, Mo. 63102
Telephone (A.C. 314):
GA. 1-3060
Teletype: 910-761-0563

GAMES AT: Busch Memorial Stadium
Capacity: 50,101

Playing field distances:
Left field fence ..... 330 feet
Center field fence ..... 414 feet
Right field fence ..... 330 feet
Plate to grandstand ..... 64 feet

Height of walls:
All: 10 feet, 6 inches

Game times:
Day (Mon. thru Fri.)..12:30 p.m.
Sat. and Holiday single ..... 1:15 p.m.
Day doubleheaders ..... 1:15 p.m.
Twi-night doubleheaders ..... 5:30 p.m.
Night games (Mon.-Fri.) ..... 8:00 p.m.
Night games (Mon.-Fri., April 10 through May 11 and month of Sept.) 7:30 p.m.
Saturday night ..... 7:00 p.m.
Sunday single ..... 1:15 p.m.
May 28, June 18, July 2, July 16, August 13 7:15 p.m.

SAN DIEGO Padres

San Diego Padres

Office: San Diego Stadium
9449 Friars Road
San Diego, California
92120

Telephone: All (A.C. 714):
283-4494

GAMES AT: San Diego Stadium, as above
Capacity: 44,790

Playing field distances:
Left field fence ..... 330 feet
Center field fence ..... 420 feet
Right field fence ..... 330 feet
Height of walls ..... 17 feet

Game times:
Day games ..... 1:00 p.m.
Night games ..... 7:30 p.m.
Sunday doubleheaders..1:06 p.m.
Twi-night doubleheaders ..... 5:00 p.m.
April 14, May 26, June 23 July 25 ..... 6:00 p.m.

SAN FRANCISCO Giants

San Francisco Giants Baseball Club

Office: Candlestick Park
San Francisco, Calif.
94124

Telephone (A.C. 415):
467-8000

Teletype: 415-393-3039

GAMES AT: Candlestick Park
Bay Shore
Capacity: 58,000

Playing field distances:
Left field ..... 335 feet
Center field ..... 410 feet
Right field ..... 335 feet

Height of walls:
All fields ..... 8 feet

Game times:
Single day games ..... 12:15 p.m.
Sunday doubleheaders 12:15 p.m.
Night games ..... 8:00 p.m.
Twi-night doubleheaders ..... 5:30 p.m.

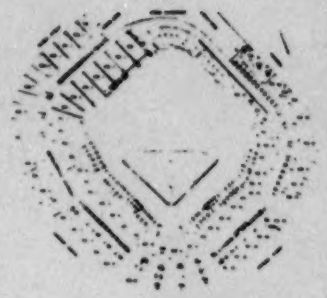
CLUB AND PARK DATA

DETROIT TIGERS
TIGER STADIUM

Seating Capacity: 54,220

Playing field distances:

Left field	340
Left center	365
Center field	440
Right center	370
Right field	325
Height of wall	9 ft.



TIGER STADIUM

Detroit Baseball Club

Tiger Stadium
Michigan & Trumbull Avenues
Detroit, Mich. 48216

Telephone: 313-962-4000

Teletype: 810-221-9422

Game Times:

Day games (except Saturdays)	1:30 P.M.
Saturday day games	2:15 P.M.
Doubleheaders	1:30 P.M.
Night games (except Monday night games)	8:00 P.M.
Monday night games	8:15 P.M.
Twi-night	5:30 P.M.

(Eastern Daylight Time April 29 to end of season).

Admission Prices:

Boxes	$4.00
Res. Grand Stand	3.00
General Admission	2.00
Bleachers	1.00

MILWAUKEE BREWERS
COUNTY STADIUM

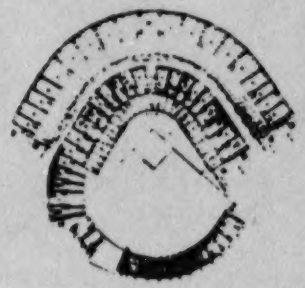
Seating Capacity: 46,000

Playing field distances:

Left field line	320
Left field	362
Left center	392
Center field	402
Right center	392
Right field	362
Right field line	315

Height of fences:

Left field	8 ft.
Right field	10 ft.



COUNTY STADIUM

Milwaukee Brewers Baseball Club, Inc.

County Stadium
Milwaukee, Wisconsin 53246

Telephone: 414-933-8650

Teletype: 910-262-3320

Game Times:

Day Games	1:30 P.M.
Night Games	7:30 P.M.
Doubleheaders	1:00 P.M.
Twi-night	6:00 P.M.

(Central Daylight Time April 29 to end of season).

Admission Prices:

Mezzanine	$5.25
Box Seats	4.25
Lower Grand Stand	3.25
Upper Grand Stand	2.25
General Admission	2.25
Bleachers	1.25

NEW YORK YANKEES
YANKEE STADIUM

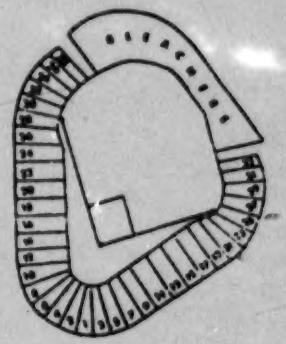
Seating Capacity: 65,010

Playing field distances:

Left field line	301
Left field	402
Left center	457
Center field	461
Right center	407
Right field	344
Right field line	296

Height of walls:

R.F. foul line	43"-45"
Right center	7'10"-14'6"
Center	22'5"
Left center	7'10"-13'10"
Left field	51"-43"



YANKEE STADIUM

New York Yankees, Inc.

Yankee Stadium
E. 161 St. & River Avenue
Bronx, N. Y. 10451

Telephone: 212-293-6000

Teletype: 710-593-2107

Game Times:

Single Day games	2:00 P.M.
Doubleheaders	1:00 P.M.
Night games	7:30 P.M.
Twi-night	5:00 P.M.
Twilight games	6:00 P.M.

(Eastern Daylight Time April 29 to end of season).

Admission Prices:

Boxes	$4.00
Res. Grand Stand	3.00
General Admission	1.50
Bleachers	1.00

CLUB AND PARK DATA

CALIFORNIA ANGELS
ANAHEIM STADIUM

Seating Capacity: 43,200

Playing field distances:

Left field	333
Left center	369
Center field	402
Right center	369
Right field	333
Height of wall	8 ft.

ANAHEIM STADIUM

Golden West Baseball Co.
Anaheim Stadium
2000 State College Blvd.
Anaheim, Calif. 92806

Telephone: 714-633-2000

Teletype: 910-394-1453

Game Times:

Day Games	2:00 P.M.
Twilight	6:00 P.M.
Night Games	8:00 P.M.
Saturday Night Games (except June 16)	7:00 P.M.
Sunday Doubleheader (June 17)	1:00 P.M.

(Pacific Daylight Time April 29 to end of season).

Admission Prices:

Club Boxes	$4.00
Field Boxes	4.00
Terrace Boxes	3.50
Reserved	2.50
General Admission	1.50

CHICAGO WHITE SOX
WHITE SOX PARK

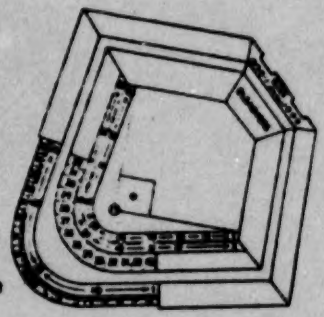
Seating Capacity: 46,550

Playing field distances:

Left field	352
Left center	375
Center field	400
Right center	375
Right field	352

Height of center field fence 5 ft.

Height of left field and right field walls 9 ft.



WHITE SOX PARK

Chicago White Sox
Division of Artnell Co.
Dan Ryan at 35th Street
Chicago, Ill. 60616

Telephone: 312-924-1000

Teletype: 910-221-5687

Game Times:

Day Games	1:15 P.M.
Night Games	8:00 P.M.

(Central Daylight Time April 29 to end of season).

Admission Prices:

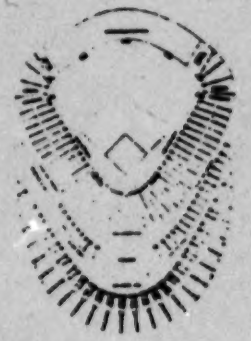
Box Seats	$4.00
Res. Grand Stand	3.00
General Admission	1.75
(14 and under)	1.00
Bleachers	1.00

KANSAS CITY ROYALS
ROYALS STADIUM

Seating Capacity: 40,813

Playing field distances:

Left field	330
Left center	385
Center field	410
Right center	385
Right field	330
Height of wall	12 ft.



ROYALS STADIUM

Kansas City Royals Baseball Club
P. O. Box 1969
Kansas City, Missouri 64141

Telephone: 816-921-8000

Teletype: 910-771-2008

Game Times:

Day Games & Doubleheaders	1:30 P.M.
Night Games	7:30 P.M.
Twi-Night	5:00 P.M.

(Central Daylight Time April 29 to end of season).

Admission Prices:

Club Box Seat	$4.00
Box Seat	4.00
Reserved Grandstand	3.00
General Admission	1.50

CLUB AND PARK DATA

BALTIMORE ORIOLES
MEMORIAL STADIUM

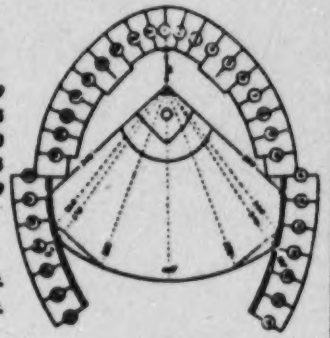
Seating Capacity: 52,137

Playing field distances:

Field	309
Left center	385
Center field	410
Right center	385
Right field	309

Height of walls:

From R.F. and L.F. to center field fence	14 ft.
Center field fence	7 ft.



MEMORIAL STADIUM

Baltimore Baseball Club, Inc.
Memorial Stadium
Baltimore, Md. 21218

Telephone: 301-243-9800
Teletype: 710-234-1616

Game Times:

Day Games*	2:15 P.M.
*Exception — July 4	1:30 P.M.
Night Games	7:30 P.M.
Twilight/Night Doubleheaders and Sunday Single Twilight Games	5:30 P.M.

(Eastern Daylight Time April 29 to end of season).

Admission Prices:

Box es	$4.00
Res. Grand Stand (Preferred)	3.00
(Lower)	2.50
(Upper)	2.00
General Admission	1.50
(Under 12)	.85
Bleachers	.85
(Under 12)	.55

BOSTON RED SOX
FENWAY PARK

Seating Capacity: 33,379

Playing field distances:

Left field	315
Center field	390
C.F. corner	420
Deep R.F.	380
Right field	302

Height of walls:

Left field (screen extends 23 ft.)	37 ft.
C.F. wall	17 ft.
Bullpens	5 ft.
R.F. fence	3-5 ft.

FENWAY PARK

Boston Red Sox
Fenway Park
24 Jersey Street
Boston, Mass. 02215

Telephone: 617-267-9440
Teletype: 710-321-6856

Game Times:

Day games (MON.-FRI.)*	1:30 P.M.
*Exceptions — April 16	11:00 A.M.
September 3	11:00 A.M.
Saturday and Sunday day games	2:00 P.M.
Day Doubleheaders	1:30 P.M.
Night games	7:30 P.M.
Twi-night	5:30 P.M.

(Eastern Daylight Time April 29 to end of season).

Admission Prices:

Roof Box	$5.00
Boxes	4.00
Res. Grand Stand	3.00
General Admission	1.50
Bleachers	1.00

CLEVELAND INDIANS
MUNICIPAL STADIUM

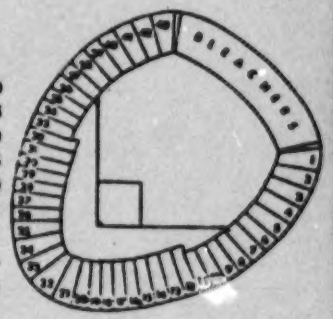
Seating Capacity: 76,997

Playing field distances:

Left field	320
Left center	385
Center field	400
Right center	385
Right field	320

Height of walls:

R.F. and L.F. stands	7 ft.
Center field	5 ft. 6 in.



MUNICIPAL STADIUM

Cleveland Indians
Municipal Stadium
Boudreau Boulevard
Cleveland, Ohio 44114

Telephone: 216-861-1200
Teletype: 810-421-8257

Game Times:

Day Games (Sunday doubleheaders and Wednesdays)*	1:00 P.M.
*Exceptions — April 7	2:00 P.M.
April 8	2:00 P.M.
Sept. 5	6:00 P.M.
Monday, Tuesday, Thursday, and Saturday	6:00 P.M.
Friday nights	8:00 P.M.

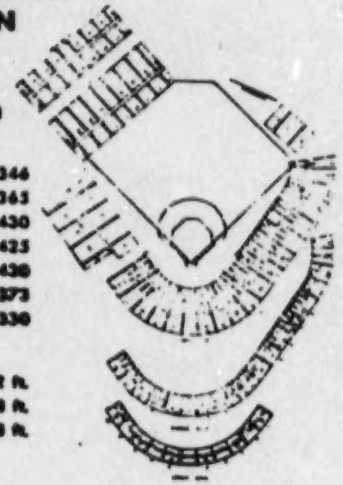
(Eastern Daylight Time April 29 to end of season).

Admission Prices:

Boxes	$4.00
Reserved Grand Stand	3.50
Mezzanine	2.50
Bleachers	.50

CLUB AND PARK DATA

MINNESOTA TWINS
METROPOLITAN STADIUM



METROPOLITAN STADIUM

Seating Capacity: 45,921

Playing field distances:

Left field line	346
Left field	363
Left center	430
Center field	423
Right center	430
Right field	373
Right field line	330

Height of fences:

Left field	12 ft.
Center field	8 ft.
Right field	8 ft.

Minnesota Twins, Inc.
Metropolitan Stadium
8001 Cedar Avenue
Bloomington, Minnesota 55420
Telephone: 612-854-4040
Teletype: 910-576-2854

Game Times:

Day Games	1:15 P.M.
May 28 (11:00 A.M.), Sept. 22 (10:30 A.M.)	
Sunday Single Games	2:00 P.M.
Doubleheaders	1:15 P.M.
Night Games	8:00 P.M.
Twi-night	5:30 P.M.

(Central Daylight Time April 29 to end of season).

Admission Prices:

Boxes	$4.00
Res. Grand Stand	3.50
Grand Stand	1.50

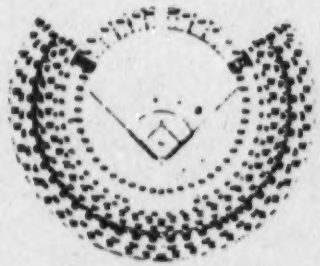
OAKLAND A's
OAKLAND-ALAMEDA COUNTY COLISEUM

Seating Capacity: 50,000

Playing field distances:

Left field	330
Left center	375
Center field	400
Right center	375
Right field	330

Height of wall ..... 8 ft.



OAKLAND COLISEUM

Oakland A's
Oakland Coliseum
Oakland, California 94621
Telephone: 415-635-4300
Teletype: 910-366-7394

Game Times:

Day Games	1:30 P.M.
Doubleheaders	1:30 P.M.
Night Games (Monday-Friday)	8:00 P.M.
Twi-night	6:00 P.M.

(Pacific Daylight Time April 29 to end of season).

Admission Prices:

Loge boxes	$5.50
First deck	4.50
Second deck	3.50
Third deck	3.00
Bleachers	2.00

TEXAS RANGERS
ARLINGTON STADIUM

Seating Capacity: 35,739

Playing field distances:

Foul lines	330
Right center	380
Left center	380
Center field	400

Height of fence ..... 11 ft.

ARLINGTON STADIUM

Texas Rangers, Inc.
Arlington Stadium
P. O. Box 1111
1500 Copeland Road
Arlington, Texas 76010
Telephone: 817-265-9101
Teletype: 910-890-5120

Game Times:

Day games Sept. 2 vs. Minnesota	1:00 P.M.
July 27 vs. California and Sept. 21 vs. California	5:00 P.M.
Night games	7:30 P.M.
Twi-night doubleheaders	6:00 P.M.

(Central Daylight Time April 29 to end of season).

Admission Prices:

Field Boxes	$4.50
Boxes	4.00
Res. Grand Stand	3.50
General Admission	2.00
Children's General Admission (13 & under)	1.00

Day Games _____

Capacity:

Greatest: _____

Least: _____

Home Runs: (minimum distance)

Yankee Stadium _____

Fenway Park _____

Ball Park	Left Field	Right Field

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Write a computer program that would analyze the data on 7A, 7B, and 7C, 7D and 7E.

For example, what is the maximum number of people that could be attending a baseball game on a given Sunday afternoon?

What is the average distance to the left field fence in the National League? the American League?

Select data that interests you and write a program that will help generalize.

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Use 9A to answer the following:

The batter hits the ball to the points:
(4,3); (-9,13); (9,2); (-6,-1); (7,22).

Is the ball foul, fair, or home run?

Is the ball in the infield or the outfield?

What do you notice about all of these hits?

The batter hits the ball to the points:
(-14,3), (14,3); (6,26), (-6,26); (2,7), (-2,7); (4,-8), (-4,-8), (-17,17), (17,17);

Is the ball foul, fair, or home run?

Look at where the first and second hits landed. The third and fourth, etc. what do you notice?

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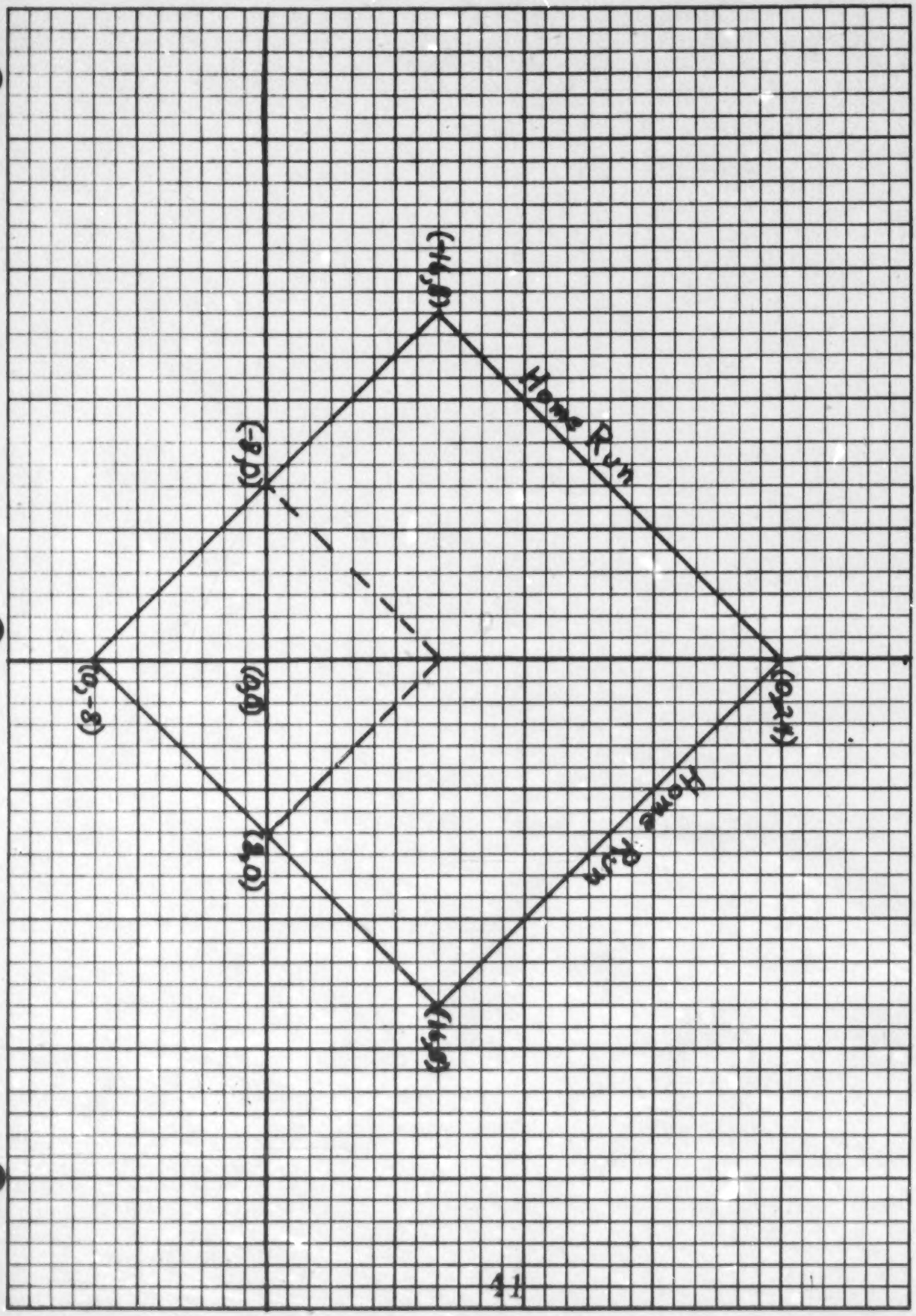

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Baseball Card Game

With the ball field diagram and cards, use the coordinate system (10B) and the following rules to play baseball (score sheets provided): 10A

Rules

1. Cards are shuffled and placed face down in the center.

2. First player turns the top card over and uses it with the diagram to determine if he got a single, double, out, etc.

3. Each player's turn is 1/2 inning and stops when he has made three outs. The game is ended after seven or nine full innings.

4. Base runners advance only the same number of bases as the hitter (i.e., a single moves all runners one base, double two bases, etc.).

5. Reshuffle after each full inning.

We suggest you use some kind of markers (four per team) to move as men on the bases (golf tees, pennies, whatever).

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Baseball Card Game
Score Sheet

TEAM ONE			TEAM TWO		
Inning	Runs	Outs	Inning	Runs	Outs
Total			Total		

TEAM ONE			TEAM TWO		
Inning	Runs	Outs	Inning	Runs	Outs
Total			Total		

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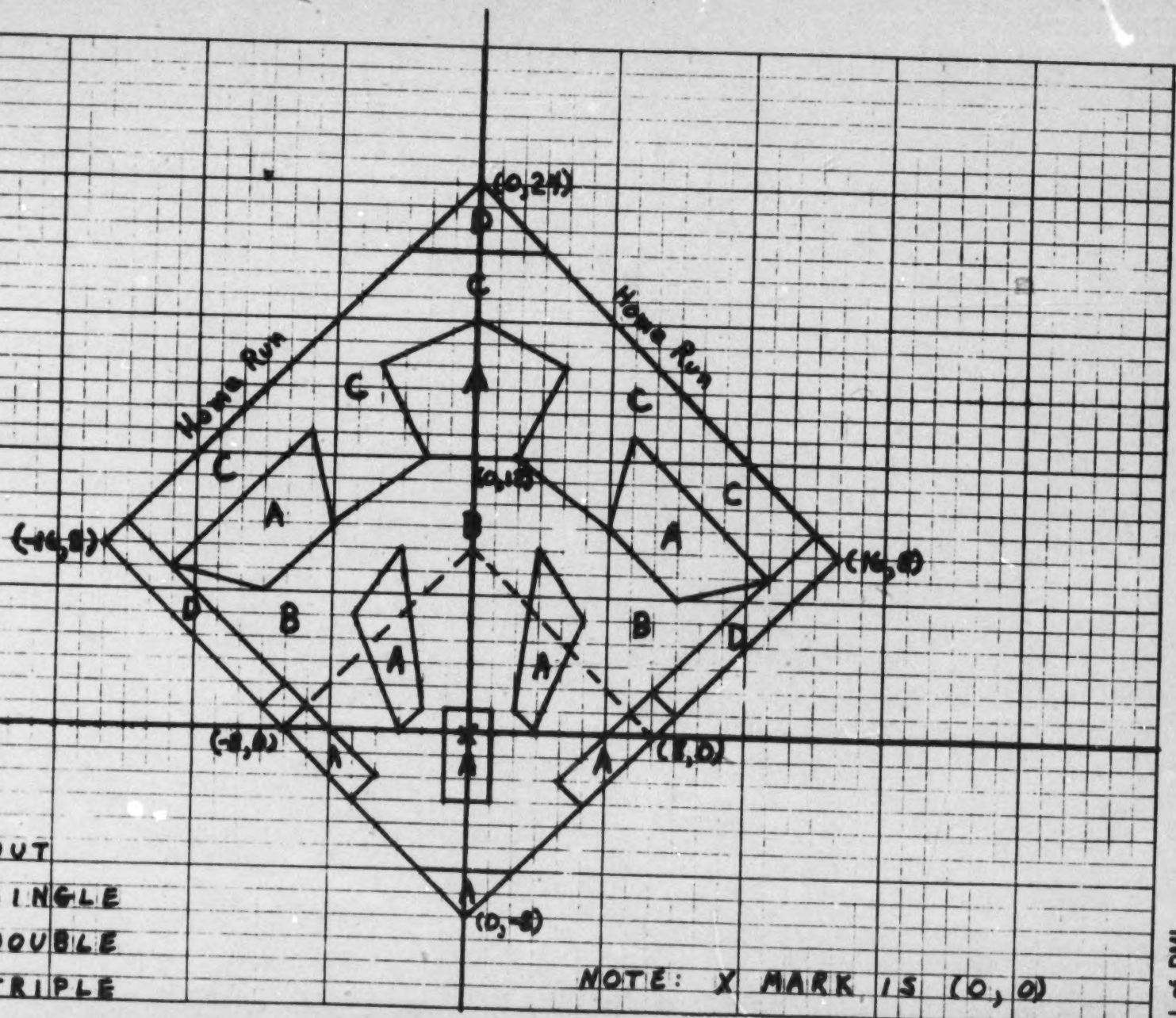
10 B


(0,24)
Home Run
Home Run
(-16,8)
(16,8)
(0,12)
(-8,0)
(8,0)
(0,-8)
A = OUT
B = SINGLE
C = DOUBLE
D = TRIPLE
NOTE: X MARK IS (0, 0)

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Baseball Card Game

Materials needed:

1. Game board on 1/4" graph paper (page 10B is a sample).
2. Three markers for runners: golf tees, paper clips, etc.
3. Score sheet (page 10A is a sample).
4. 62 card deck as follows: (See sample cards below)
   a. 13 "out" cards: (-3,6), (6,-1), (7,10), (3,1) (0,-2) (0,-7) (-8,1) (-7,11) (-9,8) (1,13) (-2,16) (-4,3) (12,7)
   b. 13 "single" cards: (1,-5) (6,3) (0,6) (-10,5) (-4,10) (3,9) (11,6) (-2,7) (4,-1) (-7,7) (2,10) (-11,6) (-4,-1)
   c. 5 "double" cards: (-4,12) (-14,9) (1,19) (13,9) (-2,20)
   d. 4 "triple" cards: (-10,3) (-1,22) (-15,8) (-14,7)
   e. 3 "home run" cards: (-14,11) (-3,22) (13,12)
   f. 5 "strike out" cards
   g. 3 "walk" cards
   h. 3 "double play" cards. In center print, "Valid only if runner on first. Otherwise just batter is out."
   i. 3 "runner steals second cards". In center print, "valid only if no runner on second".
   j. 2 "passed ball" cards. In center print "Each runner advances one base."
   k. 2 "wild pitch" cards. In center print, "each runner advances one base".
   l. 2 "foul out" cards
   m. 2 "tagged out stealing" cards. In center print, "Valid only if runner on first with second empty or runner on second with third empty".
   n. 2 "long single" cards. In center print, "If runner on second, he scores".

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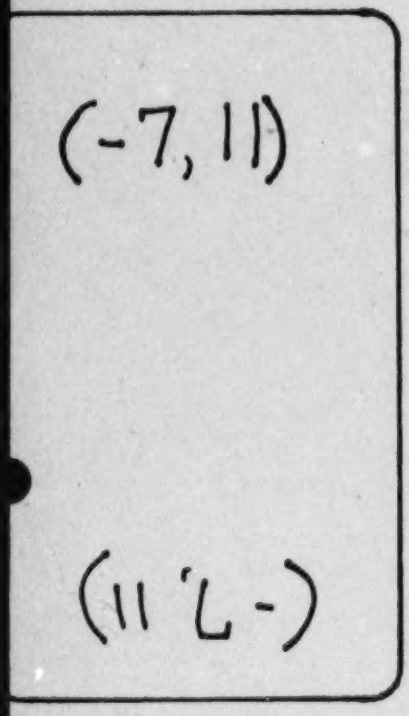
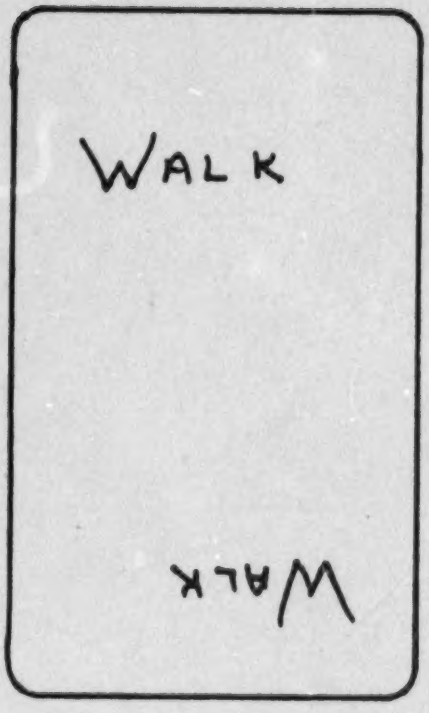
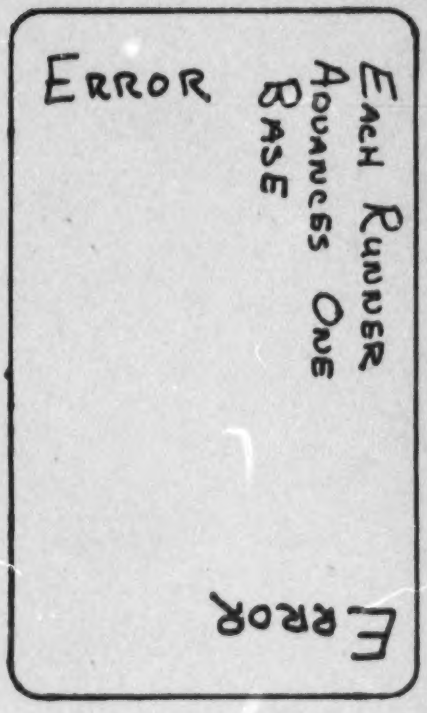
Sample Cards







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Manufacture of a Baseball[1]

Harassed pitchers may swear there's a live jackrabbit inside the ball, but according to A.G. Spalding Bros. Inc. - which manufactures all the official American and National League baseballs in its plant at Chicopee, Massachusetts - actually the core consists of a cork composition containing a small percentage of rubber. This core is 13/16 of an inch in diameter.

Two black rubber shells[2] each approximately 5/32 of an inch thick, are wrapped around the core, with a thin cushion of red rubber between the edges of the hemispherical black rubber shells. Next comes a red rubber wrapping 3/32 of an inch thick. The entire "pill" is molded perfectly round to 4 1/8 inches circumference.

Wool is wound around the pill under precise humidity and tension control in three operations: first application, 121 yards of four-ply gray woolen yarn, brings size to 7 3/4 inches circumference; second winding, 45 yards of three-ply white woolen yarn, increases it to 8 3/16 inches circumference; third winding, 53 yards of three-ply gray woolen yarn, makes size of ball coated with a layer of latex (rubber cement) to prevent unraveling. By now the overall circumference is 8 7/8 inches.

The covers, of selected horsehide leather between .050-.055 of an inch thick, are cut on a machine into the pattern of "a swollen figure 8", with 108 stitch-holes bordering each cover. Two such pieces are used to cover a baseball, After dampening the horsehide to make it pliable, the covers are handstitched with red cotton thread. Any pinching that occurs when the cover shrinks back tight is eliminated by rolling the balls. By now the circumference is the regulation 9-9 1/4 inches circumference and weighs between 5-5 1/4 ounces.

All the balls head for either of two stamping machines. One, for American League baseball, stamps the "Reach" trademark plus the AL president's autograph on the cover. The other, for official NL balls, registers the "Spalding" symbol as well as the league president's signature. Aside from the printing on the cover, the balls of both leagues are absolutely identical.

[1]Reprinted from Turkin, Hy and Thompson, S.C. The Official Encyclopedia of Baseball. New York: Barnes, 1970, P. 645.

[2]These shells are hemispheres.

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What is the difference in circumferences of the "core" and the "pill"?

What is the difference in diameters?

What is the difference in radii?

What is the difference between the circumference of the "pill" and the overall circumference including the second winding of yarn?

What are the differences in diameter between the "pill" and the first winding.

What are the differences in radii?

Which winding is the thickest?

Which winding is the thinnest?

Using the given measurements, show that the pill's circumference is 4-1/8".

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Take a field trip to a baseball game. Before you do, decide what statistical data you will collect and what you will do with it.

Design a sheet to take with you to the game to record your data and list your computed statistics.

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